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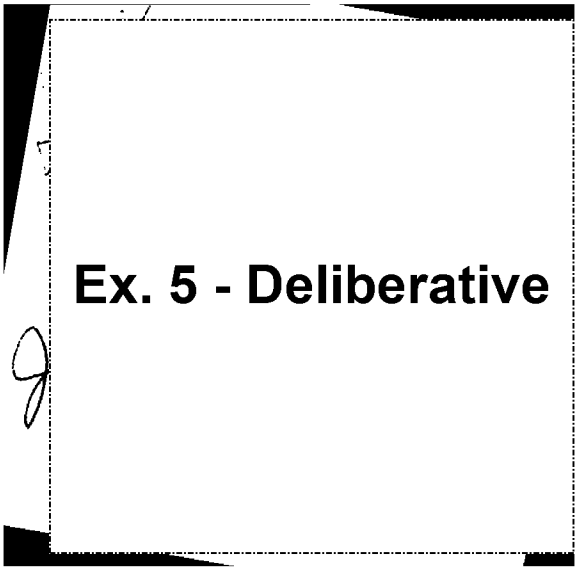
folder.

- Frank wants us
to save documents
in a network folder
- meeting w/ Paul Jones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Sue/Gene

Ryan

Elizabeth

Ex. 6 - Personal Privacy

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EPA 749-F-94-013a

CHEMICAL SUMMARY FOR METHANOL

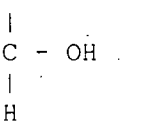
prepared by
OFFICE OF POLLUTION PREVENTION AND TOXICS
U.S. ENVIRONMENTAL PROTECTION AGENCY
August 1994

This summary is based on information retrieved from a systematic search limited to secondary sources (see Appendix A). These sources include online databases, unpublished EPA information, government publications, review documents, and standard reference materials. No attempt has been made to verify information contained in these databases and secondary sources.

I. CHEMICAL IDENTITY AND PHYSICAL/CHEMICAL PROPERTIES

The chemical identity and physical/chemical properties of methanol are summarized in Table 1.

TABLE 1. CHEMICAL IDENTITY AND CHEMICAL/PHYSICAL PROPERTIES OF METHANOL

Characteristic/Property	Data	Reference
CAS No.	67-56-1	
Common Synonyms	methyl alcohol, wood alcohol, wood spirit	Budavari et al. 1989
Molecular Formula	CH4O	
Chemical Structure		
Physical State	colorless liquid	Verschueren 1983
Molecular Weight	32.04	Budavari et al. 1989
Melting Point	-97.8øC	Budavari et al. 1989
Boiling Point	64.7øC at 760 mm Hg	Budavari et al. 1989
Water Solubility	miscible	Budavari et al. 1989
Density	d20/4, 0.7915 g/mL	Budavari et al. 1989
Vapor Density (air = 1)	1.11	Budavari et al. 1989
KOC	9	CHEMFATE 1994
Log KOW	-0.77	HSDB 1994
Vapor Pressure	126 mm Hg at 25øC	CHEMFATE 1994
Reactivity	Flammable; may explode when exposed to flame	HSDB 1994
Flash Point	12øC	Budavari et al. 1989
Henry's Law Constant	4.55 x 10-6 atm m3/mol	CHEMFATE 1994
Fish Bioconcentration Factor	<1 (estimated)	HSDB 1994
Odor Threshold	highly variable, ranges over several orders of magnitude (10 ppm to 20,000 ppm in air)	HSDB 1994
Conversion Factors	1 ppm = 1.33 mg/m3 1 mg/m3 = 0.76 ppm	Verschueren 1983

II. PRODUCTION, USE, AND TRENDS

A. Production

Methanol, also called methyl alcohol, is manufactured by 13 producers in the United States. Table 2 lists producers, plant

locations, and plant capacities. Annual production capacity is approximately 1,626 million gallons. In 1992, 1,345 million gallons of methanol were produced in the US, 495 million gallons were imported into the US, and 50 million gallons were exported (Mannsville 1993).

B. Use

Methanol is used in a variety of industrial applications. Its largest use is as a raw material for the production of methyl t-butyl ether (MTBE), a gasoline additive. It is also used in the production of formaldehyde, acetic acid, chloromethanes, methyl methacrylate, methylamines, dimethyl terephthalate, and as a solvent or antifreeze in paint strippers, aerosol spray paints, wall paints, carburetor cleaners, and car windshield washer compounds. Table 3 shows the estimated 1993 US end-use pattern for methanol.

C. Trends

US consumption of methanol reached an all-time high in 1992, with estimated 1993 consumption surpassing this level. Demand is expected to continue to rise, due primarily to predicted increases in demand for MTBE as a gasoline additive. Demand for MTBE is expected to at least double by 1995 (Mannsville 1993).

TABLE 2. United States Producers of Methanol

Company	Plant Location	Plant Capacity (in millions of gallons)
Air Products	Pensacola, FL	60
Ashland Chemical Co.	Plaquemine, LA	130
Beaumont Methanol	Beaumont, TX	250
Borden	Geismar, LA	210
Coastal Chemical	Cheyenne, WY	26
Enron (Tenneco)	Pasadena, TX	140
Georgia Gulf	Plaquemine, LA	140
Hoechst Celanese	Bishop, TX	160
Lyondell Petrochemicals	Channelview, TX	220
Quantum Chemical	Deer Park, TX	100
Sand Creek Chemical	Commerce City, CO	25
Tennessee Eastman	Kingsport, TN	65
Texaco Chemical	Delaware City, DE	100

Source: Mannsville 1993.

TABLE 3. Estimated 1993 Unites States End-Use Pattern of Methanol

Use of Methanol (typical Standard Industrial Classification (SIC) Code) (see end note 1)	Percentage of US Methanol Use
Methyl t-butyl ether (production, SIC 2911)	37%
Formaldehyde (production, SIC 2869)	24%
Acetic acid (production, SIC 2869)	10%
Chloromethanes (SIC Codes unknown)	6%
Methyl methacrylate (production, SIC 2821)	3%
Methylamines (SIC Codes unknown)	3%

Dimethyl terephthalate (SIC Codes unknown)	2%
Solvents and automotive chemicals (production, SIC 2842)	8%
Miscellaneous (no applicable SIC Code(s))	7%

Source: Mannsville 1993.

III. ENVIRONMENTAL FATE

A. Environmental Release

Methanol ranked third in the U.S. among all chemicals for total releases into the environment in 1992. Of the total released, 195 million pounds were into the atmosphere, 16.4 million pounds were into surface water, 27 million pounds into underground injection sites, and 3.3 million pounds were onto land (TRI92 1994). Methanol detected in the air from Point Barrow, Alaska averaged 0.77 ppb (CHEMFATE 1994). Ambient concentrations from Stockholm, Sweden ranged from 3.83 to 26.7 ppb while concentrations from two remote locations in Arizona were 7.9 and 2.6 ppb (HSDB 1994). In one survey, methanol was detected in drinking waters from 6 of 10 U.S. cities (HSDB 1994) but levels were not included. The chemical has also been detected in rainwater collected from Santa Rita, Arizona (HSDB 1994).

B. Transport

The miscibility of methanol in water and a low KOC (9) indicate that the chemical will be highly mobile in soil (HSDB 1994). Volatilization half-lives from a model river and an environmental pond were estimated at 4.8 days and 51.7 days, respectively (HSDB 1994). Methanol can be removed from the atmosphere in rain water (HSDB 1994).

C. Transformation/Persistence

1. Air - Once in the atmosphere, methanol exists in the vapor phase with a half life of 17.8 days (HSDB 1994). The chemical reacts with photochemically produced hydroxyl radicals to produce formaldehyde (HSDB 1994). Methanol can also react with nitrogen dioxide in polluted air to form methyl nitrite (HSDB 1994).

2. Soil - Biodegradation is the major route of removal of methanol from soils. Several species of Methylobacterium and Methylomonas isolated from soils are capable of utilizing methanol as a sole carbon source (CHEMFATE 1994).

3. Water - Most methanol is removed from water by biodegradation. The degradation products of methane and carbon dioxide were detected from aqueous cultures of mixed bacteria isolated from sewage sludge (CHEMFATE 1994). Aerobic, Gram-negative bacteria (65 strains) isolated from seawater, sand, mud, and weeds of marine origin utilized methanol as a sole carbon source (CHEMFATE 1994). Aquatic hydrolysis, oxidation, and photolysis are not significant fate processes for methanol (HSDB 1994).

4. Biota - Bioaccumulation of methanol in aquatic organisms is not expected to be significant based on an estimated bioconcentration factor of 0.2 (HSDB 1994).

V. HUMAN HEALTH EFFECTS

A. Pharmacokinetics

1. Absorption - Methanol is readily absorbed after oral, inhalation, or dermal exposure. Oral doses in humans of 71 to 84 mg/kg resulted in blood levels of 4.7 to 7.6 mg/100 mL of blood within 3 hours (Rowe and McCollister 1981). Inhalation of 500 to 1000 ppm methanol for 3 to 4 hours gave urine concentrations of 1 to 3 mg methanol/100 mL of urine at the end of exposure (Rowe and McCollister 1981). Based on urinary methanol levels, the rate of absorption of the chemical appears to be proportional to the concentration of vapor inhaled (HSDB 1994). The rate of dermal absorption increased for 35 minutes then decreased over the next 25 minutes (no other details given) (HSDB 1994).

2. Distribution - Methanol distributes rapidly in dogs exposed to 4000 to 15,000 ppm for 12 hours to 5 days; the highest concentrations of the chemical were found in blood, eye fluid, bile, and urine (HSDB 1994).

3. Metabolism - Methanol is oxidized in the human liver by the enzyme alcohol dehydrogenase (Rowe and McCollister 1981). Metabolic products include formaldehyde and formic acid (HSDB 1994). The rate of metabolism for methanol (25 mg/kg/hr) is much slower than for ethanol (175 mg/kg/hr) and is independent of concentrations in the blood (HSDB 1994). Formic acid is responsible for the toxic effects of methanol (ACGIH 1991).

4. Excretion - Methanol is excreted either as parent compound in the urine or expired air, or as the formic acid metabolite in urine (Rowe and McCollister 1981; HSDB 1994). The amount of formic acid excreted varies greatly with species from 1% in rabbits to 20% in dogs; humans are intermediate (HSDB 1994). In humans, the half-life of methanol elimination in expired air after oral or dermal exposure is 1.5 hours (HSDB 1994).

B. Acute Toxicity

Acute methanol intoxication is manifested initially by signs of narcosis. This is followed by a latent period in which formic acid accumulates in the body causing metabolic acidosis. Severe abdominal, leg, and back pain occur and visual degeneration can lead to blindness.

1. Humans - Ingestion of 80 to 150 mL of methanol is usually fatal to humans (HSDB 1994). One worker died from exposure to vapor ranging from 4000 to 13,000 ppm over 12 hours (ACGIH 1991). The concentration of 4000 ppm is roughly equivalent to a total of 1140 mg/kg over the 12 hour period (see end note 2). Poisoning by nonlethal doses can be described in three stages: (1) narcotic stage similar to ethanol; (2) latent period of 10-15 hours; (3) visual disturbances and central nervous system lesions (Rowe and McCollister 1981). Visual disturbances can lead to blindness due to edema of the retina and atrophy of the optic nerve head (HSDB 1994). Third-stage CNS lesions include headache, dizziness, abdominal, back, and leg pain, delirium that can lead to coma, and nausea (HSDB 1994). Formic acid production causes severe metabolic acidosis (Rowe and McCollister 1981).

2. Animals - Oral LD50 values for methanol in animals are 0.4 g/kg in the mouse, 6.2 to 13 g/kg in the rat, 14.4 g/kg in the rabbit, and 2 to 7 g/kg in the monkey (Rowe and McCollister 1981). The LD50 for dermal application to rabbits is 20 mL/kg (approximately

16 g/kg) (Rowe and McCollister 1981). Dose-response data for inhalation vary with species, dose, and duration (8800 ppm for 8 hours to 152,800 ppm for 94 minutes). Symptoms of intoxication include incoordination, salivation, lethargy, narcosis, and death (Rowe and McCollister 1981).

C. Subchronic/Chronic Toxicity

Chronic exposure to methanol, either orally or by inhalation, causes headache, insomnia, gastrointestinal problems, and blindness in humans and hepatic and brain alterations in animals. EPA has derived an oral RfD (reference dose) (see end note 3) for methanol of 0.5 mg/kg/day, based on the absence of liver and brain effects in animals exposed by mouth to 500 mg/kg/day.

1. Humans - "Chronic" exposure to methanol vapors (no time or dose given) caused conjunctivitis, headache, giddiness, insomnia, gastric disturbances, and bilateral blindness (ACGIH 1991). Marked vision loss occurred in one worker exposed to 1200 to 8000 ppm vapor for 4 years (ACGIH 1991).

2. Animals - No effects were seen in rats given 1% (approximately 140 mg/kg/day) methanol in drinking water for 6 months (Rowe and McCollister 1981). Hepatic abnormalities (proteinic degeneration, altered RNA metabolism) occurred in rhesus monkeys given 3 to 6 g/kg for 3 to 20 weeks and in rats given 10, 100, or 500 mg/kg/day for one month (Rowe and McCollister 1981). Rabbits chronically fed methanol (no dose or time given) had increasing blood levels, brain and eye edema, and myelin thinning (HSDB 1994). Male and female rats were gavaged with 100, 500, or 2500 mg/kg/day for 90 days (U.S. EPA 1994). Increased levels of SGPT and SAP as well as decreased brain weights were seen in both sexes at the highest dose; a no-observed-adverse effect level (NOAEL) for the study was 500 mg/kg/day. Based on these data, the U.S. EPA (1994) calculated a chronic RfD (see end note 4) for methanol of 0.5 mg/kg/day. No toxic effects were seen in dogs exposed by inhalation to either 10,000 ppm for 3 minutes, 3x/day, for 100 days or to 450 or 500 ppm, 8 hours/day for 379 days (Rowe and McCollister 1981). Ultrastructural changes were observed in the photoreceptor cells of rabbits exposed to 46.6 ppm for 6 months (Rowe and McCollister 1981). Rowe and McCollister (1981) concluded that the effects of combined oral and inhalation exposure appear to be additive. Rats exposed by inhalation to 16.8 ppm, 4 hours/day, for 6 months and administered 0.7 mg/kg/day orally had changes in blood morphology, oxidation-reduction processes, and liver function (Rowe and McCollister 1981).

D. Carcinogenicity

No information was found on the carcinogenicity of methanol in the secondary sources searched.

1. Humans - No information was found in the secondary sources searched concerning the carcinogenicity of methanol to humans.

2. Animals - No information was found in the secondary sources searched concerning the carcinogenicity of methanol to animals. The NTP has assigned a project leader for methanol and the design of the study is in progress (NTP 1994).

E. Genotoxicity

Methanol was negative for cell transformation in Syrian

hamster embryo cells (clonal assay and viral enhanced), sister chromatid exchange in vitro, and for aneuploidy and chromosome aberrations in Neurospora crassa (GENETOX 1992). The micronucleus test and the assay for chromosome aberrations in mammalian polychromatic erythrocytes were inconclusive (GENETOX 1992).

F. Developmental/Reproductive Toxicity

No information was found on the developmental toxicity of methanol in humans. Methanol can cause adverse effects in the developing offspring in rats at doses that cause overt maternal intoxication.

1. Humans - No information was found in the secondary sources searched regarding the developmental or reproductive toxicity of methanol to humans. However, one of the breakdown products of the artificial sweetener asparatame is methanol. Increased blood methanol levels did not lead to increased formic acid levels in women receiving up to 200 mg/kg asparatame (no other details reported) and no evidence of fetal risk was detected (HSDB 1994).

2. Animals - Rats were exposed by inhalation, 7 hours/day, to 5000 or 10,000 ppm methanol on gestation days 1-19 or to 20,000 ppm on days 7-15. Maternal intoxication (unsteadiness) occurred at the highest dose and coincided with extra or rudimentary ribs and urinary or cardiovascular defects in the fetuses (ACGIH 1991). Male rats had significantly lowered testosterone levels after inhalation exposure to 200 ppm methanol for 6 weeks; at 10,000 ppm a change in luteinizing hormone was also observed (HSDB 1994).

G. Neurotoxicity

Methanol causes central nervous system depression in humans and animals as well as degenerative changes in the brain and visual system.

1. Humans - Methanol causes narcosis similar to ethanol intoxication and nonlethal doses can lead to blindness. Autopsy of individuals after lethal doses revealed edema and hyperemia of the brain and degeneration of the ganglion cells of the retina (Rowe and McCollister 1981).

2. Animals - Acute methanol intoxication in animals causes CNS depression as observed by narcosis, incoordination, lethargy, drowsiness, and prostration (Rowe and McCollister 1981).

V. ENVIRONMENTAL EFFECTS

A. Toxicity to Aquatic Organisms

Methanol has low acute toxicity to aquatic organisms; lethal concentrations are much greater than 100 mg/L. Ninety-six hour LC50 values for fish are 28,100 mg/L for Pimephales promelas (fathead minnow), 20,100 mg/L for Oncorhynchus mykiss (rainbow trout), and >28,000 mg/L for Alburnus alburnus (bleak) (AQUIRE 1994). Forty-eight hour LC50 values for Cyprinus carpio (common carp) and Carassius auratus (goldfish) are 28,000 mg/L and 1,700 mg/L, respectively (AQUIRE 1994). Growth inhibition occurred for 4 strains of Anabaena (blue-green algae) over a range of EC50's of 2.57-3.13% for 10-14 days (AQUIRE 1994). The LC50 for Artemia salina (brine shrimp) is >10,000 mg/L in 24 hours and that for Culex restuans (mosquito) is 20,000 mg/L in 18 hours (AQUIRE 1994).

B. Toxicity to Terrestrial Organisms

No information was found in the secondary sources searched regarding the toxicity of methanol to terrestrial organisms. However, based on the range of oral LD50's, 0.4 to 14.2 g/kg, for monkeys, rats, mice, and rabbits (Rowe and McCollister 1981), it is unlikely that methanol would be toxic to terrestrial animals at environmental levels.

C. Abiotic Effects

Methanol reacts with nitrogen dioxide in polluted atmospheres to produce methyl nitrite (HSDB 1994). According to the definition provided in the Federal Register (1992), methanol is a volatile organic compound (VOC) substance. As a VOC, methanol can contribute to the formation of photochemical smog in the presence of other VOCs.

VI. EPA/OTHER FEDERAL/OTHER GROUP ACTIVITY

The Clean Air Act Amendments of 1990 list methanol as a hazardous air pollutant. Occupational exposure to methanol is regulated by the Occupational Safety and Health Administration. The permissible exposure limit (PEL) is 200 parts per million parts of air (ppm) as an 8-hour time weighted average (29 CFR 1910.1000).

Federal agency and other group activities for methanol are summarized in Tables 3 and 4.

TABLE 3. EPA OFFICES AND CONTACT NUMBERS FOR INFORMATION ON METHANOL

EPA OFFICE	LAW	PHONE NUMBER
Pollution Prevention & Toxics	Toxic Substances Control Act (Sec. 8E)	(202) 554-1404
	Emergency Planning and Community Right-to-Know Act (EPCRA) Regulations (Sec. 313)	(800) 424-9346
	Toxics Release Inventory data	(202) 260-1531
Air	Clean Air Act	(919) 541-0888
Solid Waste & Emergency Response	Comprehensive Environmental Response, Compensation, and Liability Act (Superfund)/ Resource Conservation and Recovery Act / EPCRA (Sec. 304/311/312)	(800) 424-9346

TABLE 4. OTHER FEDERAL OFFICE/OTHER GROUP CONTACT NUMBERS FOR INFORMATION ON METHANOL

Other Agency/Department/Group	Contact Number
Agency for Toxic Substances & Disease Registry	(404) 639-6000
American Conference of Governmental Industrial Hygienists (Recommended Exposure Limit (see end note 5): 200 ppm) (Recommended Short Term Exposure Limit (see end note 6): 250 ppm)	(513) 742-2020
Consumer Product Safety Commission	(301) 817-0994
Food & Drug Administration	(301) 443-3170

National Institute for Occupational Safety & Health (Recommended Exposure Limit (see end note 5): 200 ppm)	(800) 356-4674
Occupational Safety & Health Administration (Permissible Exposure Limit (see end note 7): 200 ppm)	Check local phone book for phone number under Department of Labor

VII. END NOTES

1. Standard Industrial Classification code is the statistical classification standard for all Federal economic statistics. The code provides a convenient way to reference economic data on industries of interest to the researcher. SIC codes presented here are not intended to be an exhaustive listing; rather, the codes listed should provide an indication of where a chemical may be most likely to be found in commerce.

2. Calculated using the factor 1.33 (Verschueren 1983) to convert 4000 ppm to 5320 mg/m3 which is multiplied by 0.214 (the 12-hour breathing rate, 15 m3 [from the occupational standard 8-hour breathing rate, 10 m3] divided by the assumed adult body weight, 70 kg) to obtain the dose in mg/kg (U.S. EPA 1988).

3. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of the daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during the time period of concern.

4. The RfD is an estimate (with uncertainty spanning perhaps an order of magnitude) of the daily exposure level for the human population, including sensitive subpopulations, that is likely to be without an appreciable risk of deleterious effects during the time period of concern.

5. The ACGIH/NIOSH exposure limits are time-weighted average (TWA) concentrations for an 8-hour workday (ACGIH) and up to a 10-hour workday (NIOSH) for a 40-hour workweek.

6. This is a recommended 15-minute exposure limit value that should not be exceeded at any time.

7. The OSHA exposure limit is a time-weighted-average (TWA) concentration that must not be exceeded during any 8-hour workshift during a 40-hour workweek.

VIII. CITED REFERENCES

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APPENDIX A. SOURCES SEARCHED FOR FACT SHEET PREPARATION

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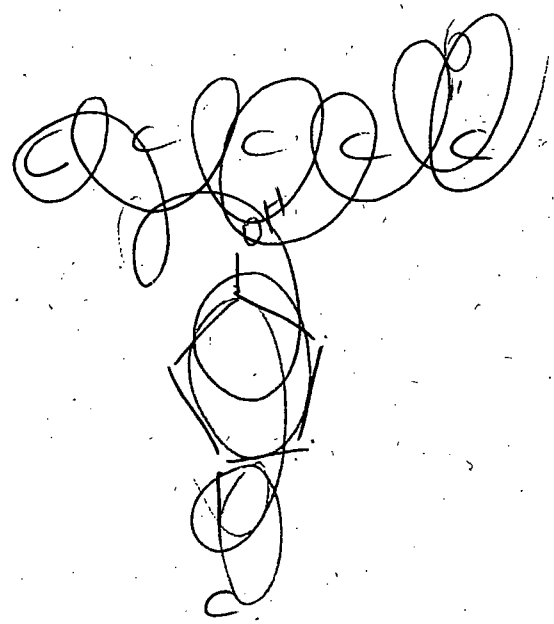


Arguto, William

From: Ferrell, Mark
Sent: Thursday, January 23, 2014 10:47 AM
To: Burns, Francis; Arguto, William; Snyder, Raquel; Melvin, Karen
Cc: Miller, Linda; Ryan, Daniel; White, Terri-A
Subject: RE: Sen. Rockefeller call - TODAY

Importance: High

From my discussion with Sen. Rockefeller's state director Rochelle "Rocky" Goodwin last night it is clear that the EPA's efforts to respond to his (multiple) requests for updates and information is not meeting their needs or expectations.

To begin to address this, I'm scrubbing our scheduled 3pm call to update each other where we are in gathering responses to the questions from his office below.

I have scheduled a conference call for 3:15pm today (Jan 23) with Rockefeller's staff (Rocky Goodwin, state director, Asley Orr, depty state director, Laura Chamber, energy/environment LA) to provide our updates and responses to the senator's questions. Please make every effort necessary to prepare your responses. If you cannot make this call, please assign a delegate or call me ASAP at (304) 542-0231. Otherwise, I assume everyone can make the call.
Thank you for your hard work under challenging circumstances!

CALL TIME: 3:15PM

Ex. 6 - Personal Privacy

Here are the questions we'll be expected to respond to:

Ex. 5 - Deliberative

Sen. Rockefeller is asking:

1) Specific language clarifying the EPA's statutory authority in incid
Charleston, West Virginia.

2) Any area's within EPA's statutory authority that need to be stren
mission more quickly and effectively.

Ex. 5 - Deliberative

3) Has EPA had any direct interaction with the manufacturer (Eastman) of the chemical (Crude MCHM) and if so, what have we discovered? If not, why not?

Ex. 5 - Deliberative

Ex. 5 - Deliberative

4) Is Crude MCHM a surficant? An alcohol? A long chain polymer? Will it cling to pipes and pvc plumbing in homes?

Ex. 5 - Deliberative

5) What is EPA's role in the oversight of large water treatment plants like West Virginia American Water?

Ex. 5 - Deliberative

6) What are EPA's responses to Rockefeller's original letter to EPA/CDC requesting collaboration on long term health studies? (letter attached)

Product Safety Assessment
DOW™ Dipropylene Glycol Phenyl Ether Products

Select a Topic:

Names

- CAS No. 51730-94-0
- Dipropylene glycol phenyl ether
- Propanol, (methyl-2-phenoxyethoxy)
- (Methyl-2-phenoxyethoxy)propanol
- DOW™ DiPPh Technical
- DOW™ DiPPh products
- DiPPh
- Propanol, 1-(methyl-2-phenoxyethoxy)-
- Propanol, 2-(methyl-2-phenoxyethoxy)-
- DOW™ PPh Basic

Back to top

Product Overview

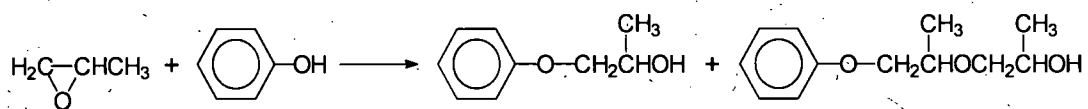
- DOW™ dipropylene glycol phenyl ether (DiPPh) is a colorless to yellow liquid with a mild odor. Dow manufactures several commercial products that contain diPPh, including DOW DiPPh Technical and DOW PPh Basic, which are propylene glycol ether blends whose major component is dipropylene glycol phenyl ether (>75% and >40%, respectively). These products are slightly soluble in water, have a low evaporation rate, and a high flash point.[1] For further details, see Product Description.
- DOW DiPPh products are primarily used as chemical intermediates (or building blocks) for the production of other chemicals. They are also used in polymer coating formulations as coalescents (film-forming aids).[2] For further details, see Product Uses.
- The hazards associated with DOW diPPh products differ significantly due to the presence of caustic soda (caustic, NaOH) in DOW™ PPh Basic. For more information on the hazards associated with caustic, see the Product Safety Assessment for caustic soda.
- Eye contact with DOW PPh Basic (which contains caustic) may cause severe irritation with corneal injury, possibly resulting in permanent impairment of vision or even blindness. Chemical burns to the eye may occur following contact with diPPh products containing caustic. Brief skin contact may cause severe burns. Swallowing diPPh products containing caustic may result in burns of the mouth and throat.[3]
- Eye contact with DOW DiPPh Technical (which does not contain caustic) may cause severe irritation with slight corneal injury. Prolonged skin contact may cause slight skin irritation with local redness. Low toxicity is expected following ingestion. For further details, see Health Information.
- At room temperature, vapors of diPPh products are minimal due to low volatility. Vapor from heated material or mist may be hazardous on single exposure. For further details, see Health Information or Physical Hazard Information.

- DOW™ diPPh products are not sold for direct consumer use. Worker exposure to these products is possible at propylene glycol ether manufacturing sites or at facilities using these products in fuel or mining applications or to produce other chemicals or coating formulations. For further details, see Exposure Potential.
- DOW DiPPh products are stable at typical use and storage temperatures. These products can oxidize at elevated temperatures creating pressure build-up in closed systems. Avoid contact with strong acids, strong bases, and strong oxidizers.[4] For further details, see Physical Hazard Information.
- Dipropylene glycol phenyl ether is readily biodegradable, unlikely to accumulate in the food chain, and is slightly to moderately toxic to fish and other aquatic organisms. For further details, see Environmental Information.

Back to top

Manufacture of Product[5,6]

- **Capacity** – DOW™ dipropylene glycol phenyl ether (DiPPh) products are manufactured at facilities in Freeport, Texas (USA). The estimated 2007 U.S. production capacity for all propylene oxide-based glycol ethers was 194,000 metric kilotonnes (428 million pounds).
- **Process** – DOW dipropylene glycol phenyl ether, a by-product from the manufacture of propylene glycol phenyl ether (PPh), is produced when two molecules of propylene oxide combine with phenol. Although the reaction product is purified by distillation, both compounds are present in the final product. The reaction sequence is shown below.



Back to top

Product Description[7]

DOW™ dipropylene glycol phenyl ether (DiPPh) is a colorless to yellow liquid with a mild odor. Dow manufactures several commercial products that contain diPPh, including DOW DiPPh Technical and DOW PPh Basic, which are propylene glycol ether blends whose major component is dipropylene glycol phenyl ether (>75% and >40%, respectively). Components of the products include: dipropylene glycol phenyl ether, propylene glycol phenyl ether, and other reaction products. PPh Basic also contains up to 5% sodium hydroxide (caustic).

These products are slightly soluble in water, have a low evaporation rate, and a high flash point.[8]

For more information about blend components propylene glycol phenyl ether (PPh) and caustic, see the relevant Safety Data Sheet or Product Safety Assessment.

Back to top

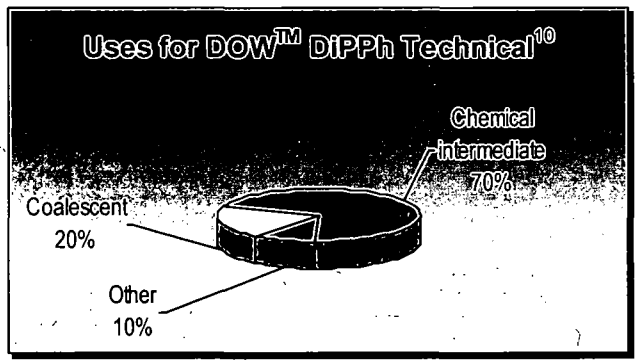
Product Uses[9,10]

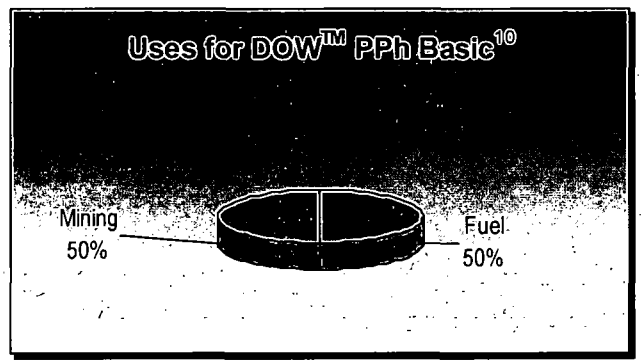
DOW™ DiPPh Technical is an industrial chemical used for the following applications:

- Chemical intermediate for the manufacture of surfactants
- Coalescing agent in coatings formulations
- Other

DOW PPh Basic is also an industrial chemical, with the following uses:

- Fuel
- Mining





Back to top

Exposure Potential[11]

DOW™ dipropylene glycol phenyl ether (DiPPh) products are used in industrial applications. Based on the uses for these materials, the public could be exposed through:

- **Workplace exposure** – Exposure can occur either in a dipropylene glycol phenyl ether manufacturing facility or in the various industrial or manufacturing facilities that use this material. It is produced, distributed, and stored in closed systems. Those working with this material in manufacturing operations or fuel, formulation and mining applications could be exposed during maintenance, sampling, testing, or other procedures. Each facility should have a thorough training program for employees and appropriate work processes, ventilation, and safety equipment in place to limit unnecessary exposure. See Health Information.
- **Consumer exposure to products containing dipropylene glycol phenyl ether** – DOW DiPPh products are not sold for direct consumer use. They are industrial products for commercial applications only. Consumer contact is unlikely. See Health Information.
- **Environmental releases** – In the event of a spill, the focus is on containing the spill to prevent contamination of soil and surface or ground water. For small spills, absorb material with sand or vermiculite. Collect in suitable and properly labeled containers. See Environmental, Health, and Physical Hazard Information.
- **Large release** – Industrial spills or releases are infrequent and generally contained. If a large spill does occur, dike the area to contain the spill. Evacuate the area and keep upwind of the spill. Ventilate the area. Pump recovered material into suitable and properly labeled containers. Use appropriate safety equipment. See Environmental, Health, and Physical Hazard Information.
- **In case of fire** – Keep people away and deny unnecessary entry. Extinguish fires with water fog or fine spray, dry-chemical or carbon-dioxide extinguishers, or foam. Use of a direct water stream may spread the fire. Water fog applied gently may be used as a blanket for fire extinguishment. Firefighters should wear positive-pressure, self-contained breathing apparatus (SCBA) and protective firefighting clothing. Follow emergency procedures carefully. See Environmental, Health, and Physical Hazard Information.

For more information, see the relevant Safety Data Sheet.

Back to top

Health Information[12]

Eye contact – Eye contact with DOW™ PPh Basic (contains caustic) may cause severe irritation with corneal injury, which may result in permanent impairment of vision, even blindness. Chemical burns may occur. Eye contact with DOW DiPPh Technical may cause severe irritation with slight corneal injury.

Skin contact – Brief contact with DOW PPh Basic may cause severe skin burns. Symptoms may include pain, severe local redness, and tissue damage. Prolonged skin contact may cause slight skin irritation with local redness. Prolonged skin contact is unlikely to result in absorption of harmful amounts of DOW PPh Basic or DOW DiPPh Technical.

Inhalation – At room temperature, vapors of these products are minimal due to low volatility. Based on information from similar substances, vapor from heated material or mist may be hazardous on single exposure, and mist may cause severe irritation of the upper respiratory tract (nose and throat).

Ingestion – Swallowing DOW™ PPh Basic may result in burns of the mouth and throat and gastrointestinal irritation or ulceration due to the hazards associated with caustic. DOW DiPPh Technical, and dipropylene glycol phenyl ether alone are expected to have low toxicity if swallowed.

Repeated exposure – Based on available data with similar substances, repeated exposures to dipropylene glycol phenyl ether itself is not anticipated to cause additional significant adverse effects.

For more information on products containing dipropylene glycol phenyl ether, see the relevant Safety Data Sheet.

For more information about blend components propylene glycol phenyl ether (PPh) and caustic, see the relevant Safety Data Sheet or Product Safety Assessment.

Back to top

Environmental Information[13]

DOW™ DiPPh products are propylene glycol ether blends containing diPPh and propylene glycol phenyl ether (PPh). DiPPh and PPh have very low volatility and are moderately soluble in water. When introduced to water, they will have a tendency to remain in water. They have minimal tendency to bind to soil or sediment. They are unlikely to persist in the environment and are readily biodegradable, which suggests they will be rapidly and completely removed from water and soil environments, including biological wastewater treatment plants. These materials and their mixtures have a low potential to accumulate in the food chain and are slightly to moderately toxic to fish and other aquatic organisms on an acute basis.

The Organisation for Economic Co-operation and Development (OECD) Screening Information Data Set (SIDS) Initial Assessment Profile for the PPh component concluded that the chemical has a low hazard profile and, thus, is currently of low priority for further work. The profile document may be accessed at http://www.chem.unep.ch/irptc/sids/OECDSIDS/770354.pdf.

For more information on products containing dipropylene glycol phenyl ether, see the relevant Safety Data Sheet.

For more information about blend components propylene glycol phenyl ether (PPh) and caustic, see the relevant Safety Data Sheet or Product Safety Assessment.

Back to top

Physical Hazard Information[14]

DOW™ dipropylene glycol phenyl ether products are stable at typical use and storage temperatures. This material can oxidize at elevated temperatures, creating pressure build-up in closed systems. Do not distill to dryness.

Avoid contact with strong acids, strong bases, and strong oxidizers.

For more information, see the relevant Safety Data Sheet.

For more information about blend components propylene glycol phenyl ether (PPh) and caustic, see the relevant Safety Data Sheet or Product Safety Assessment.

Back to top

Regulatory Information

Regulations may exist that govern the manufacture, sale, transportation, use, and/or disposal of dipropylene glycol phenyl ether. These regulations may vary by city, state, country, or geographic region. Information may be found by consulting the relevant Safety Data Sheet or Contact Us.

Back to top

Additional Information

- Safety Data Sheet (http://www.dow.com/webapps/msds/msdssearch.aspx)
- Contact Us (http://www.dow.com/oxysolvents/contact/index.htm)
- Chinn, Henry, *et al.*, "Glycol Ethers," *Marketing Research Report: Chemical Economics Handbook*, SRI Consulting, November 2007

For more business information about DOW™ dipropylene glycol phenyl ether products, visit the Dow Oxygenated Solvents website at www.dow.com/oxysolvents/.

Back to top

References

[1] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 1 and 4.
[2] The Dow Oxygenated Solvents website – P Series Glycol Ethers (http://www.dow.com/oxysolvents/prod/pseries.htm).
[3] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 1–2 and 5.
[4] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 4–5.
[5] Capacity estimates provided by The Dow Chemical Company.
[6] Chinn, Henry, *et al.*, "Glycol Ethers," *Marketing Research Report: Chemical Economics Handbook*, SRI Consulting, November 2007, pages 18 and 27.
[7] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 1, 2 and 4.

[8] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 1 and 4.
[9] The Dow Oxygenated Solvents website – P Series Glycol Ethers (http://www.dow.com/oxysolvents/prod/pseries.htm).
[10] Product usage estimates provided by The Dow Chemical Company.
[11] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 2–4.
[12] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 1–2 and 5.
[13] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 5–7.
[14] *PPH, Basic Material Safety Data Sheet,* The Dow Chemical Company, ID No. 1010291/1001, Version 5.0 February 24, 2009, pages 4–5.

Back to top

NOTICES:

As part of its 2015 Sustainability Goals, Dow has committed to make publicly available safety assessments for its products globally. This product safety assessment is intended to give general information about the chemical (or categories of chemicals) addressed. It is not intended to provide an in-depth discussion of health and safety information. Additional information is available through the relevant Safety Data Sheet, which should be consulted before use of the chemical. This product safety assessment does not replace required communication documents such as the Safety Data Sheet.

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Back to top

Form No. 233-00601-MM-0609

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Charleston, WV Chemical Leak
USEPA Region 3
Concept of Operations Document– EPA ConOps
January 11, 2014

Operational Period: January 12, 2014: 800hrs-January 19, 2014: 0759hrs
24 Hour Number: 215.814.3255
24 Hour National Response Center Number – 800. 424. 8802
(to report new and oil or hazardous substances release)
www.epaosc.org/charlestonwvchemicalleak

Key Participants:

EPA Federal On-Scene Coordinator (FOSC) – EPA's Incident Commander is Dennis Matlock

Other USEPA
- Region 3 Incident Management Team (IMT)
- Special Teams
  - EPA Environmental Response Team (ERT)
  - EPA Office of Ground Water and Drinking Water Development (ORD)
  - Regional Water Protection Division Water Program (WPD)
  - EPA Region 3 Laboratory
- Contracted Resources
  - Superfund Technical Assistance and Response Team Contractor (START)
  - Emergency Response and Removal Services Contractor (ERRS)
  - Contract Laboratory Network

Agency for Toxic Substances and Disease Registry (ATSDR)

A. Purpose:

The U.S. Environmental Protection Agency (EPA) Region 3 Office of *Preparedness and Response (OPR)* maintains response capabilities, through the authorities of the FOSC, to respond to a release and/or a threatened release of oil and hazardous substances 24 hours a day, 365 days per year. The activities associated with the Charleston, WV Chemical Leak (CWVCL) are complex enough to merit EPA to deploy these capabilities so response actions can occur in a timely manner.

B. Communications:

Requests for EPA support should come the EPA R3 Regional Operations Center (EPA3 REOC) Phone Duty Officer using the 24 hour Number: 215.814.3255

C. Implementation:

The assets described below in this document:

- Are available to support the State of West Virginia in its response to the release, and in its restoration of water systems to a healthy functioning state.
- Can be deployed under the EPA FOSC's authority per the National Contingency Plan (NCP) in service of the State directly, and/or under the National Response Framework in support of FEMA Mission Assignments.
- Are both regional and national and may be obtained through EPA Special Teams under the National Contingency Plan (NCP), but are coordinated thru the EPA FOSC (IC).
- May be accessed by contacting the **24 Hour EPAR3EOC Number: 215.814.3255.**

EPA's Region 3 Incident Management Team (IMT) is supporting FOSCs (who are located on scene) from the EPA3 REOC, located in Philadelphia, PA.

EPA oil and hazardous substance response support is provided by EPA On-Scene Coordinators (FOSCs) who coordinate and direct response to releases of hazardous substances and discharges of oil to navigable waters *as authorized by the National Contingency Plan (NCP)*. The EPA FOSC will coordinate all EPA resources including its special teams.

If FEMA issues a pending EPA a mission assignment, then these same EPA resources will be available for Emergency Support Function #10 response pursuant to the National Response Framework. The EPA resources will be integrated into the FEMA Consequence Management Branch and will be staged or managed from the Incident Command Post, per EPA FOSC determination.

EPA R3 is prepared to send additional, comparable resources however they are needed as the incident changes.

D. EPA R3 Assets and their Capabilities:

The **FOSC**, are on scene responding pursuant to the NCP. They have the capabilities to address hazardous substance mitigation, environmental sampling and analysis, direct read-out air monitoring support, personnel decontamination support and other similar assistance. They also have the ability to respond more broadly under a FEMA mission assignment which is pending FEMA approval.

The **EPA3 REOC**, located in Philadelphia, is supporting the Response. The REOC can provide backup resources, technical information and coordinate with EPA HQ in Washington DC. These resources include:

- Additional FOSC support.
- A fully trained EPA R3 Incident Management Team (IMT).
- The Response Support Corps (RSC), a cadre of program/media trained professionals to

augment oversight of field activities and provide experts in specific program fields like drinking water and others;

- Representatives from the Agency for Toxic Substances and Disease Registry (ATSDR) for environmental health assessment and consult purposes;
- Additional public information officer resources for direct assistance to the local health departments;
- Additional support as needed under the NRF.

Analytical Resources:

EPA Region 3 Laboratories and a Contract Laboratory Network—The EPA Regional Lab can assist in sample processing and can augment sampling capacities for the response through its laboratory network.

EPA Special Teams:

EPA Environmental Response Team (ERT)—has the capacity for mobile multi-media sample screening and real time air monitoring and screening. EPA ERT's Trace Atmospheric Gas Analyzer (TAGA) instruments can measure concentrations of pre-selected industrial compounds in the air at the parts-per-billion level as the bus is being driven down the street;

EPA Office of Ground Water and Drinking Water Development (OGWDWD)--Professionals with a focus on drinking water security, distribution system water quality, and monitoring for contamination incidents.

Water Protection Program (WPD)--Water Protection Program personnel are available on reach back or on the ground capacity to provide technical guidance on water safety concerns to facilities, local health departments and others.

Contracted Resources:

Superfund Technical Assistance and Response Team Contractor (START) and Superfund Emergency Response and Removal Services Contractor (ERRS) EPA contractors are ready to deploy their technical air monitoring, data management, and heavy earth moving equipment.

D. Outreach:

EPA has and will provide **Liaison Officers (LNOs)** where requested either by FEMA/DHS or Local Governments. At this time our LNO is actively maintaining the EOC informed of local needs and press briefings.

EPA has and will provide **Public Information Officers (PIO)** available to augment the capacity of local health departments to reach large numbers of public.

State of West Virginia
Source Water Assessment and Protection Program

Source Water Assessment Report

WVAWC - Kanawha Valley
Kanawha County
PWSID: WV3302016

Prepared by:

West Virginia Department of Health and Human Resources
Bureau for Public Health
Office of Environmental Health Services
Source Water Protection Unit

Date: April 2002

Surface Water Public Water Supply Systems
Source Water Assessment and Protection Program (SWAPP)
Susceptibility Report

Prepared by the West Virginia Bureau for Public Health, Source Water Assessment and Protection Unit

Date Prepared: Thursday, April 25, 2002

What is the Purpose of a Susceptibility Report?

A susceptibility report identifies the most significant potential contaminant sources that could threaten the quality of your public water supply. Your susceptibility ranking does not imply poor water quality. Regular water tests best reflect actual water quality. This report will be used by public water supply systems with a surface water source. In addition, this report will enhance West Virginia's existing watershed approach to water quality improvement and protection. Table 1 provides you information on your public water supply.

What is SWAPP?

The SWAPP, established under the Safe Drinking Water Act, requires every state to:

- inventory land uses within the recharge areas of all public water supplies;
- assess the susceptibility of drinking water sources to contamination from these land uses; and
- publicize the results to provide support for improved protection of sources.

Table 1: Public Water Supply (PWS) Information

PWS Name	WVAWC-Kanawha Valley
PWS Address	P.O. Box 1906 Charleston WV 25301
PWS ID Number	WV3302016
County	Kanawha
System Type	Community

The West Virginia Bureau for Public Health (BPH) is undertaking this task. The rankings of susceptibility of your intake (s) to potential contamination are listed in Table 2.

Table 2: Intake Information

Facility Name	Source Name	Design Meets Regulations	Susceptibility Ranking
WVAWC-Kanawha Valley	Elk River	Yes	High

The BPH Central Office assessed the source, West Virginia American Water Company (WVAWC)-Kanawha Valley. A file review and field survey were used to conduct the assessment.

What is my Source Water Protection Area (SWPA)?

Unlike ground water aquifers, which have a natural protective layer above them, all surface waters are susceptible to contamination because they are exposed at the surface and lack a protective barrier from contamination. Accidental spills, releases, sudden precipitation events that result in overland runoff, or storm sewer discharges can allow pollutants to readily enter the source water and potentially contaminant the drinking water at the intake. Because of this, the SWPA consists of two types of delineations.

- **Watershed Delineation Area**

The first type of delineation is the Watershed Delineation Area (WSDA). Figure 1 shows the extent of the WSDA, which covers approximately 1,527 square miles in the Elk River Watershed. The WSDA includes the entire watershed area upstream of the intake up to the boundary of the West Virginia state border, or a topographic boundary. The perimeter of the catchment area provides the water to the water supply intake.

- **Zone of Critical Concern**

The second type of delineation is the Zone of Critical Concern (ZCC). Figure 2 shows the ZCC area, which covers approximately 5,969 acres. The ZCC is a corridor along streams within the WSDA area that warrants a more detailed inventory and management due to its proximity to the surface intake and to the susceptibility to potential contaminants. The ZCC is calculated using a mathematical model that accounts for stream flows, gradient, and area topography. The length of the ZCC is based on a five hour time of travel. The ZCC width is 1000 feet from each bank of the principal stream and 500 feet from each bank of the tributaries draining into the principal stream.

What is Susceptibility?

Susceptibility is a measure of your intake's potential for contamination from land uses and activities within the SWPA at concentrations that pose a concern. The purpose of the susceptibility analysis is to provide a pointer to what action a public water system should take to further define and reduce susceptibility. This may include recommendations for a more detailed inventory and assessment, monitoring work, or an indication of the type and intensity of source water and other protection activities needed.

The possibility of a release from potential contaminant sources is greatly reduced if best management practices (BMP's) are used. However, the susceptibility determination for your intake did not take into account whether BMP's are being used.

Susceptibility of a drinking water intake does not mean a customer will drink contaminated water. Water Suppliers protect drinking water by monitoring and treating water supplies, and using BMP's and source water protection measures to ensure that safe water is delivered to the tap.

How Was The Water Supply Susceptibility Determined?

Your intake (s) susceptibility is based on the following:

Resource Characterization

The purpose for conducting the Resource Characterization analysis of the delineated SWPA is to obtain an understanding of its physical, biological, chemical, and hydrological characteristics. Four resource characteristics were evaluated:

- The potential for surface runoff to occur;
- The ease that surface runoff transport material can be delivered into the stream;
- The movement through the SWAP area; and
- The biological and chemical health of the surface water resource in the SWAP area.

- **Potential for Surface Runoff to Occur**

The soil types present in the watershed area and the associated soil properties have a direct influence on the potential for surface runoff to occur. As infiltration rate of soil increases, (more precipitation soaking in rather than running off) the contaminant load associated with the reduced runoff should decrease. Table 3 provides a summary of the associated soil groups.

Table 3: Summary of Soil Associations in the WSDA

Soil Associations	Soil Drainage	Topographic Setting
Kanawha-Hackers	Well drained	Gently sloping
Gilpin-Upshur-Vandalia	Well drained	Gently sloping to very steep
Clymer-Gilpin-Dekalb	Well drained	Very steep
Buchanan-Chavies-Pope	Moderate to Well drained	Steep to nearly level
Gilpin-Upshur-Buchanan	Moderate to Well drained	Very steep
Gilpin-Dekalb-Buchanan	Moderate to Well drained	Very steep
Calvin-Belmont-Mecksville	Well drained	Gently sloping to very steep
Potomac-Tioga-Holly	Well and Poorly drained	Nearly level
Mandy-Snowdog-Gauley	Moderate to Well drained	Strongly sloping to very steep
Cateache-Shours-Belmont	Well drained	Gently sloping to very steep

- **Ease of movement of material into the Stream System (Rate of Overland Material Transport):**

The size, shape, and slope of the SWAP area have a direct influence on material transported by surface runoff. In general, the longer the overland travel distance and travel time that surface runoff has taken in order to reach a stream channel, the greater the chance it has to deposit and filtrate the contaminants that may occur. Table 4 provides an analysis of the size, shape, and slope.

Table 4: Hydrologic Setting

Size of WSDA Area (mi^2)	1,527
Shape of WSDA Area	Long & Narrow
Stream Length (Main Stem) (mi)	186
Average Watershed Slope	10 to 30 %

- **Movement of Water through the Watershed Area**

A number of physical and natural factors can influence the movement of water through the SWAP area. The pattern and development of the drainage network of the SWAP area directly influence the rate of water movement. Evaluation of the hydrologic cycle will provide an indication of the amount of annual rainfall that is absorbed into the ground or becomes runoff. Table 5 summarizes the total mileage of streams contained in the WSDA, average stream gradients of the main stem, average rainfall, the nearest relevant USGS stream gauge, distance to gauge, topographic position of gauge, annual mean discharge, high flow, and low flow.

Table 5: Movement of Water

Number of Stream Miles	2,051
Average Stream Gradient (Main Stem)	11.13 ft/mi
Average Rainfall	44
Nearest Relevant USGS Stream Gauge	031197000
Distance to Relevant USGS Stream Gauge (mi)	22
USGS Stream Gauge Topographic Position	Upstream
Annual Mean Discharge (cfs)	3,259
High Flow (cfs)	158,000
Low Flow (cfs)	595

- **Review of Water Quality Data**

In order to characterize the condition of the surface water within the watershed, the available chemical and biological water quality data was reviewed. This data was collected as part of the BPH and the West Virginia Department of Environmental Protection (DEP) implementation of the federal Safe Drinking Water Act and Clean Water Act. Water quality data was evaluated to help provide direct pointers to a source of contamination and to direct the focus for additional source evaluations. Additionally, immediate source water protection efforts will be identified by this review.

Available water quality data includes test results from treated drinking water, finished water, and untreated source water (raw water) conducted by the water supplier; ambient water chemistry; biological criteria and monitoring (bacteria, macroinvertibrates and fish); and habitat evaluation. The sampling requirements for public water systems vary depending on the type of system and the federal regulated testing requirements. Therefore, a lack of water quality impacts may indicate the lack of a certain type of sampling rather than a lack of contamination.

Summary of Raw and Finished Water Quality Results from Public Water System

Water sampling conducted by West Virginia American Water Company indicates that raw water turbidity maximums appear to have increased significantly over the past two years, based on the five years of data reviewed. The WVAWC-Kanawha Valley Plant takes a raw water bacteriological sample almost on a daily basis; which is not required by regulation. These tests indicate elevated levels during periods of high water.

There have been no occasions when the observed concentrations have been above the established MCLs for these parameters in the finished water. For additional information on the finished water quality, please review the consumer confidence report for a yearly summary of the water quality.

Summary of Chemical and Biological Water Quality Results from the West Virginia DEP

In 2000, the DEP conducted biological and chemical water quality monitoring on 153 streams totaling 832 miles in the Elk River watershed for the 305b report, as a requirement of the federal Clean Water Act. Two hundred and twenty miles (26%) were fully supporting their overall designated uses. Considering major and moderate/minor impacts, the principal causes of impairment in the watershed are metals, siltation, and habitat alteration (non-flow). Additional significant causes of impairment are pH and Fecal Coliform. Considering major and moderate/minor impacts, the principal sources of pollution in the watershed are unknown source, petroleum activities, and abandoned mining. During this reporting cycle, 460.41miles of stream in the Elk River watershed were monitored for toxics. Of these, 65.09 miles (14.1%) had elevated levels of toxics.

The DEP performed an ecological assessment of the Elk River and its tributaries in 1997. Assessments at each site included measurements of physical attributes of the stream and riparian zone, observations of activities and disturbances in the surrounding area, water quality analysis, and benthic macroinvertebrate collection. Of the 145 sites sampled, 26 were impaired, 14 were potentially impaired, 95 were unimpaired, and 10 were collected by incomparable methods and could not be scored.

Summary of Other Available Chemical and Biological Water Quality Data

Not Available

POTENTIAL SIGNIFICANT CONTAMINANT SOURCES (PSCS'S):

Inventory of Potential Significant Contaminant Sources

The purpose of providing an inventory of certain types of land uses, potential significant contaminant sources, and activities within the SWAP area is to aid in reducing the risk posed to the public drinking water supply. The following subsections provide information regarding the methodology used to generate the inventories.

The inventory portion of the SWAP consists of two steps:

- The first step is the broad inventory based primarily on regulated and existing databases. The inventory consists of a general land use analysis, the identification of regulated activities in the delineated WSDA areas, and an analysis of road and rail crossings adjacent to the streams in the WSDA area.

- The second step is the detailed inventory of PSCS's in the ZCC. The detailed source inventory is conducted to identify PSCS's that were not captured in the broad regulated source inventory and to field verify the PSCS's in the ZCC. PCS's located during the inventory are found on Figure 2.

A detailed risk-assessment of the PSCS's was beyond the scope of this survey because of minimal data and resources. Local decision makers should do the detailed risk analysis because they are better suited to make the bridge from assessment work to protective strategies. The West Virginia SWAP program can provide guidance to the decision makers and help in prioritizing the PSCS sources.

- **Existing (primarily regulated) Database Review**

Table 6 is a summary of existing PSCS's based on public information obtained from various federal, state, and local agencies that maintain environmental regulatory databases. These databases provide information about the regulatory status of a property and incidents involving use, storage, spilling or transportation of oil, and hazardous materials.

Table 6: Summary of existing (primarily regulated) PSCS's

	NUMBER	PERCENT
WSDA	53	100
ZCC	26	49

- **Summary of the Detailed Inventory**

Table 7 is a summary of the detailed inventory of potential contaminant sources in the ZCC. The detailed source inventory was conducted to identify PSCS's that were not identified in the existing database review and to verify the location of the PSCS within the ZCC. Additional potential significant contaminant sources that were identified in detailed inventories of the ZCC consist of commercial activities (Shell Gas Station, Sun Belt Rentals), municipal operations (City of Charleston Sewage Lift Station, Road Salt Storage), and industrial operations (Allegheny Power Company, Pennzoil Manufacturing Plant). Of these PSCS's, some of the industrial sources may have large volumes of potential contaminant stored.

Table 7: Summary of PSCS within the ZCC

Potential Contaminant Source	TOTAL PSCS'S	PERCENT
AGRICULTURE	1	2
RESIDENTIAL	0	0
MUNICIPAL	4	8
COMMERCIAL	39	76
INDUSTRIAL	7	14

- **Transportation Network**

A summary of the transportation network is shown in Table 8. This information can be used to aid in planning for transportation related accidents that could result in contamination of the source water in the delineated WSDA. Table 9 is a summary of the transportation network stream crossings in the WSDA. Please note that miles of train tracks could be less due to decommissioning of tracks.

Table 8: Transportation Network Summary for WSDA

	Within 100 feet of stream	Total
Miles of Interstate	0.08	83
Miles of Primary	0.05	71

Miles of Secondary	1.4	379
Miles of Train Tracks	21	212

Table 9: Transportation Network Stream Crossings in the WSDA

	Train Tracks	Interstate	Primary Roads	Secondary Roads
Number of Stream Crossings	180	47	44	224

- **General Land Use**

The general land use analysis will provide an indication of which land uses predominate throughout the SWAP area, near the intake, or adjacent to the rivers, streams, lakes, and reservoirs. The land use in the SWAP area is shown in Table 10.

Table 10: General Land Use

LAND USE	WSDA Area (Acres)	WSDA % of Total	ZCC Area (Acres)	ZCC % of Total
Shrub Land	11,343	1.00	102	2.00
Woodland	888,568	91.00	2,754	46.00
Water	10,314	1.00	797	13.00
Roads	1,201	0.10	133	2.00
Power lines	2,312	0.20	16	0.30
Urban	11,633	1.00	1,745	29.00
Agriculture	46,476	5.00	406	7.00
Barren	5,250	0.50	15	0.30
Wetland	401	0.04	1	0.02

SWAPP Area Assessment and Protection Activities

Analysis of the Resource Characterization and potential significant contaminant sources of the SWAP area for the WVAWC-Kanawha Valley indicates that the water supply is susceptible to possible future contamination based on the following:

- ✓ The long narrow shape, steep topographic setting, and the large size of the WSDA present an increased potential for contamination. An important flood control/recreational impoundment is located on the Elk River at Sutton in Braxton County approximately 100 miles upstream of the intake. In addition, the large number of stream crossings (495 total) provides the opportunity for an accidental release/spill of material to easily get directly into the stream drainage network. Source water protection efforts should be directed toward the establishment of an effective and efficient emergency response plan if one does not currently exist.
- ✓ Current land use practices appear to be having an adverse impact on the ecological health of the Elk River Watershed. Coal, oil, gas, timbering, and sandstone quarries are among the industries present. Agriculture is dominated by livestock and related products. This is evidenced by of the 832.41 miles assessed in the DEP 303b report; only 26.5% were fully supporting the overall designated use. Higher bacteria levels are generally concentrated around populations centers, caused by regulated or unregulated discharges. In addition, the health of the Elk River may be impacted by a number of regulated and unregulated point and non-point sources in the ZCC and WSDA.

Recommendations:

- ✓ Protection efforts should focus on the collection of additional information on the point and non-point sources present to evaluate the risk;
- ✓ Work with the Department of Health and Human Resources, other state agencies and local officials to make sure your intake is included in local regulations and inspections efforts;
- ✓ Restrict access to the intake area and post the area with Drinking Water Protection Area signs;
- ✓ Address any biological contaminant issues; and
- ✓ Protection options need to be actively considered to further evaluate and manage all potential contaminant sources and the WVAWC-Kanawha Valley public water supply should place a high priority on protecting its supply source.

NEXT STEP – SWAP Protection Plan

The next step in source water protection planning is to prepare a SWAP protection plan. The SWAP protection plan incorporates this source water delineation assessment report and three additional sections: Contingency Planning, Alternative Sources, and Management Planning.

Contingency Planning

A contingency plan documents the system's planned response to interruption of the source water supply.

Alternative Sources

Information pertaining to alternative water sources focusing on long-term source replacement should the system be required to develop a new source of water due to contamination (or other reasons). This section outlines the most likely sources that can be used as an alternate water source.

Management Planning

Management planning is the most important element of SWAP. The management plan identifies specific activities that will be pursued by the system to protect their water resources. The system will benefit by taking a proactive approach to source water protection in their watersheds. It is anticipated that most of the management effort will focus on coordination with government agencies and periodic surveys of the watersheds. It may be necessary to conduct a limited number of special studies to determine actual risk and consequences for selected contaminant sources. This information may be needed before decisions can be made on management activities.

Need additional information?

Additional information or sources of information can be obtained by calling or visiting the BPH web site at www.wvdhhr.org/bph/swap or phoning 304-558-2981.

Glossary:

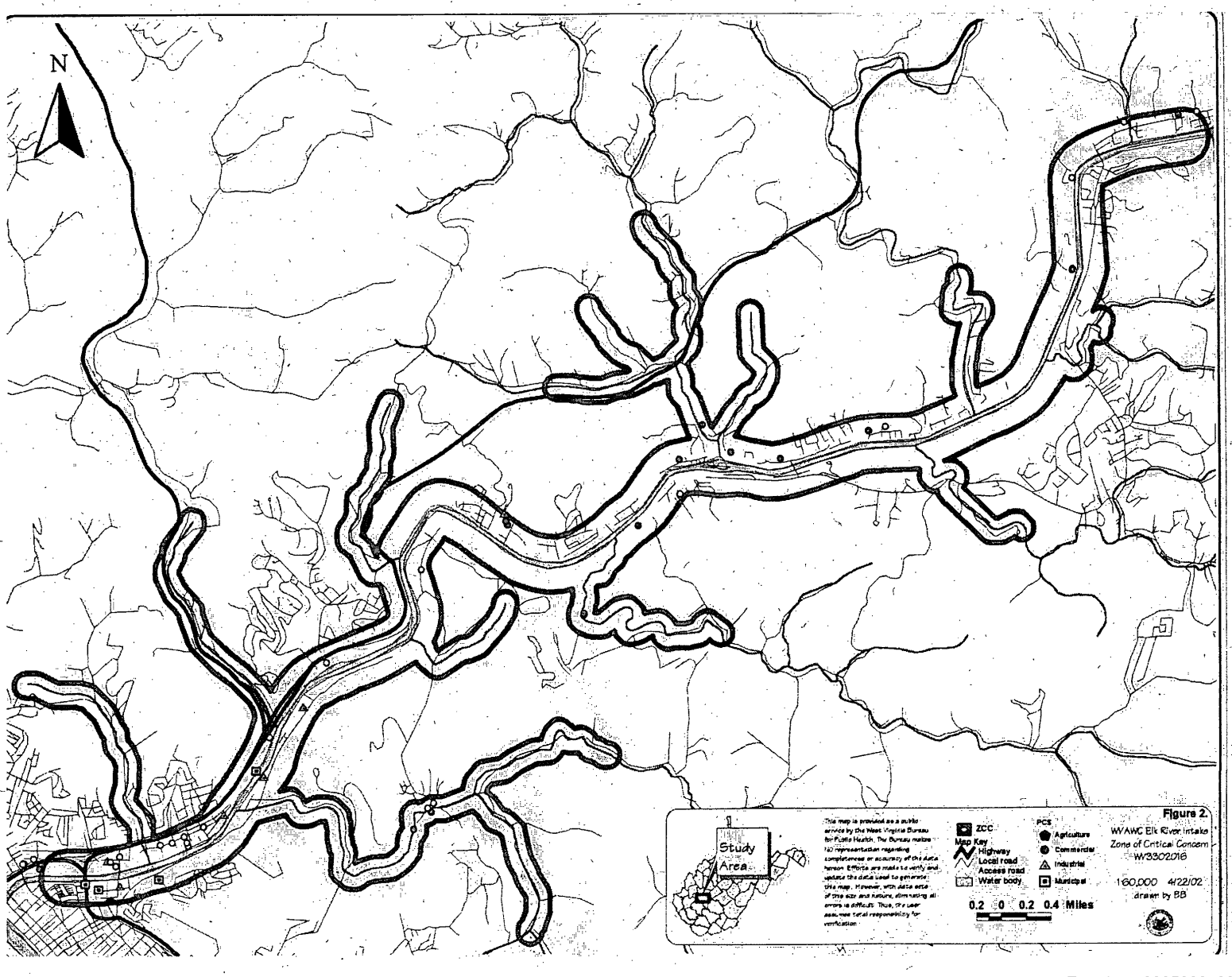
Best Management Practices (BMP's) are operational procedures used to prevent or reduce pollution.

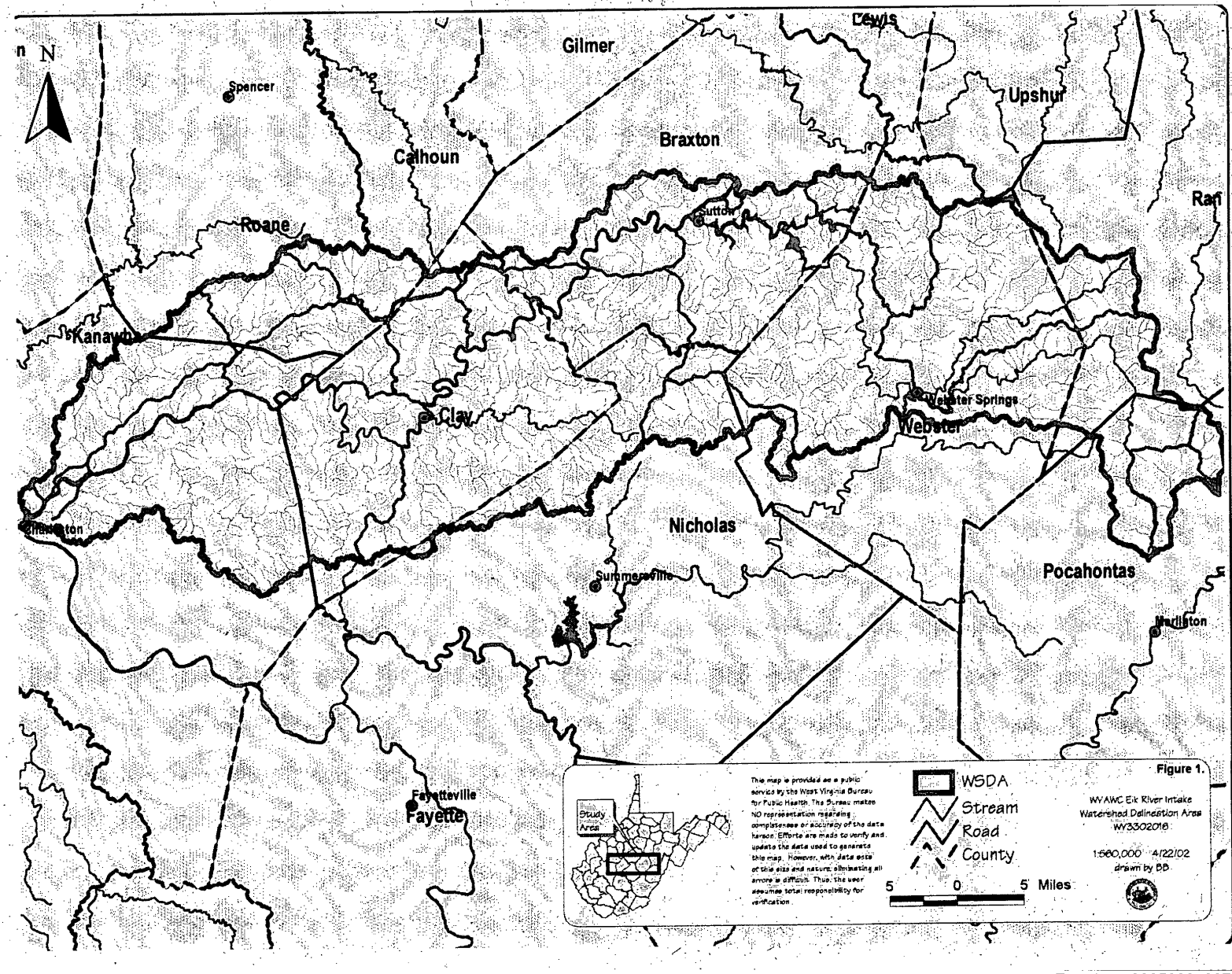
Public Water System (PWS) is a system for the provision to the public of pipe water for human consumption, if such system has at least 15 service or regularly serves an average of at least 25 individuals daily at least 60 days of the year.

Water Quality Data is used to help assess both the potential pathogen contamination and other compliance monitoring (Nitrates) parameters associated with public water supply wells.

Potential Significant Contaminant Source (PSCS) is a facility or activity that stores, uses, or produces chemicals or elements, and has the potential to release contaminants identified in the state program within a source water protection area in an amount, which could contribute significantly to the contaminants of the source waters of the public water supply.

Disclaimer - The coverage's presented in this program are under constant revision as new sites or facilities are added. They may not contain all the potential or existing sites or facilities. The West Virginia Bureau for Public Health is not responsible for the use or interpretation of this information. Please report any inaccuracies on either the map or inventory by phoning 304-558-2981.





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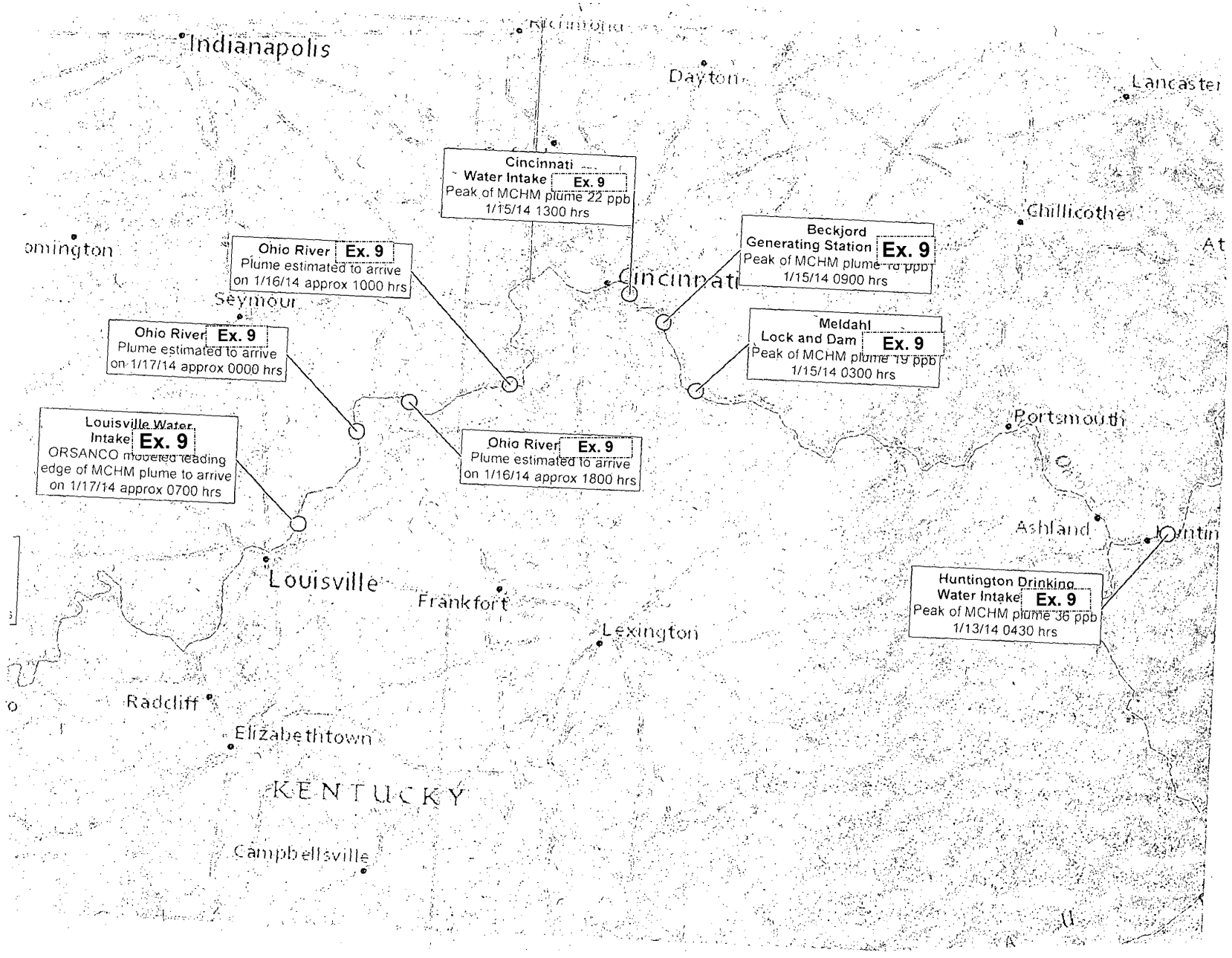

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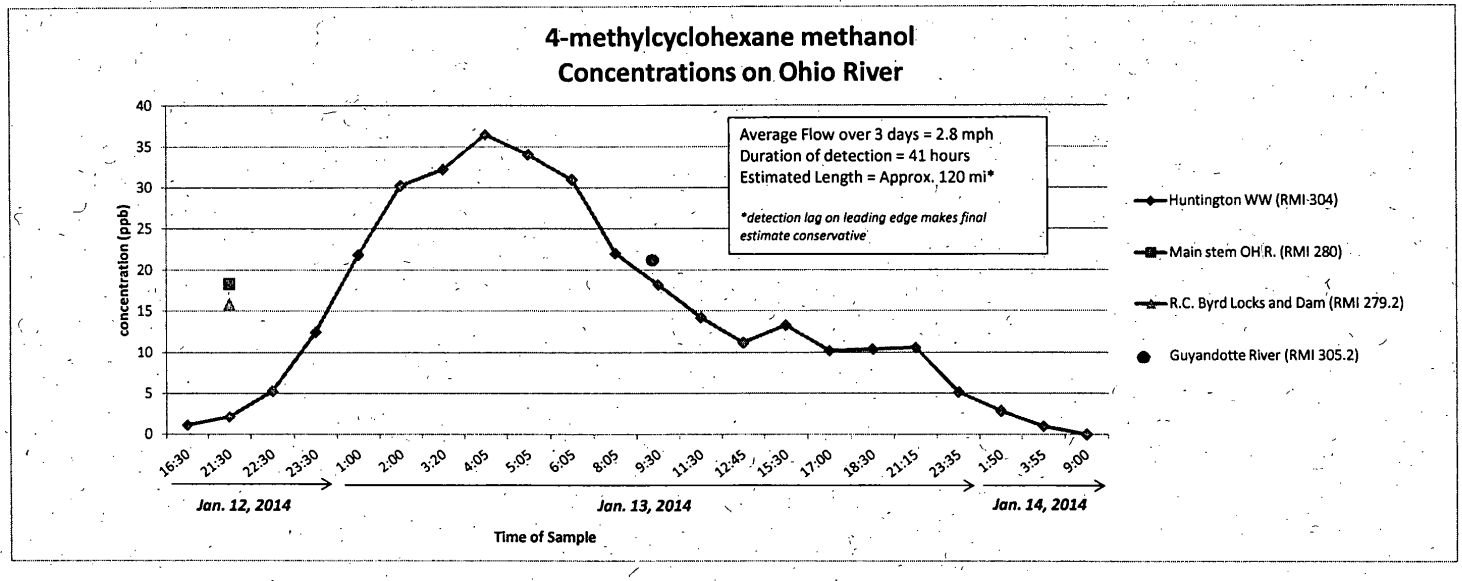

RMI	Date	Time	Conc. (ppb)							area under the curve
304	1/12/2014	16:30	1.12	1	1.00		0.00	1.00	1.12	8.175
304	1/12/2014	21:30	2.15	5:00	5.00		5.00	6.00	2.15	3.715
304	1/12/2014	22:30	5.28	1:00	1.00		1.00	7.00	5.28	8.895
304	1/12/2014	23:30	12.51	1:00	1.00		1.00	8.00	12.51	31.515
304	1/13/2014	1:00	21.87	1:50	1.00	0.833333	1.83	9.83	21.87	26.075
304	1/13/2014	2:00	30.28	1:00	1.00		1.00	10.83	30.28	41.693
304	1/13/2014	3:20	32.26	1:20	1.00	0.333333	1.33	12.17	32.26	25.781
304	1/13/2014	4:05	36.49	0:45		0.75	0.75	12.92	36.49	35.270
304	1/13/2014	5:05	34.05	1:00	1.00		1.00	13.92	34.05	32.525
304	1/13/2014	6:05	31	1:00	1.00		1.00	14.92	31	53.040
304	1/13/2014	8:05	22.04	2:00	2.00		2.00	16.92	22.04	28.482
304	1/13/2014	9:30	18.17	1:25	1.00	0.416667	1.42	18.33	18.17	32.400
304	1/13/2014	11:30	14.23	2:00	2.00		2.00	20.33	14.23	15.888
304	1/13/2014	12:45	11.19	1:15	1.00	0.25	1.25	21.58	11.19	33.674
304	1/13/2014	15:30	13.3	2:45	2.00	0.75	2.75	24.33	13.3	17.663
304	1/13/2014	17:00	10.25	1:30	1.00	0.5	1.50	25.83	10.25	15.495
304	1/13/2014	18:30	10.41	1:30	1.00	0.5	1.50	27.33	10.41	28.916
304	1/13/2014	21:15	10.62	2:45	2.00	0.75	2.75	30.08	10.62	18.398
304	1/13/2014	23:35	5.15	2:20	2.00	0.333333	2.33	32.42	5.15	5.006
304	1/14/2014	1:50	2.86	1:15	1.00	0.25	1.25	33.67	2.86	4.010
304	1/14/2014	3:55	0.99	2:05	2.00	0.083333	2.08	35.75	0.99	2.516
304	1/14/2014	9:00	0	5:05	5.00	0.083333	5.08	40.83	0	0.000
280	1/12/2014	21:52	18.3							
279.2	1/12/2014	21:36	15.91							469.133
305.2	1/13/2014	9:15	21.04							

SAMPLE ANALYSIS LOG FOR WV AMERICAN WATER INCIDENT
VARIOUS COLLECTION SITES
AS OF: JAN 13 2014, 1117

SAMPLE LOCATION / COUNTY	TIME & DATE	SAMPLE NUMBER	SAMPLE TEAM	ANALYSIS TEAM	RESULTS PPM/RECEIVED
HYD #168 / KANWAHA	JAN 11 257PM	168	WVAW	DHHR	1.39/ JAN 11 833 PM
HYD #168 / KANWAHA				DUPONT	.7/ JAN 11 1012PM
HYD #1783 / KANWAHA	JAN 11 315PM	1783	WVAW	DHHR	.76/ JAN 11 833PM
HYD #1783 / KANWAHA				DUPONT	.8/JAN 12 158AM
HYD #978 / KANWAHA	JAN 11 323PM	978	WVAW	DHHR	.92/ JAN 11 833PM
HYD #978 / KANWAHA				DUPONT	.7/ JAN 12 158AM
HYD# Ex. 6 - Personal Privacy	JAN 11 321PM	1900	WVAW	DHHR	.76/ JAN 11 833PM
HYD#				DUPONT	.6/JAN 12 158AM
Ex. 6 - Personal Privacy	JAN 11 330PM	1530	WVAW	DUPONT	1/ JAN 12 158AM
HYD# 1418	JAN 11 4PM	1600	WVAW	DUPONT	.9/ JAN 12 158PM
HYD# 2071	JAN 11 5PM	2071	WVAM	DHHR	.79/ JAN 12 122AM
HYD# 2071				DUPONT	.8/ JAN 12 158AM
HYD # 1167	JAN 11 424PM	1624	WVAW	DHHR	.68/ JAN 11 107AM
HYD# 1167				DUPONT	1/JAN 11 1012
HYD# 448	JAN 11 507PM	1707	WVAW	DUPONT	1/ JAN 12 158AM
HYD# 1501	JAN 11 506PM	1706	WVAW	DHHR	.93/ JAN 12 107AM
HYD# 1501				DUPONT	.7/ JAN 12 158AM
HYD# 986	JAN 11 418PM	1618	WVAW	DHHR	.87/ JAN 12 221AM
HYD# 986				DUPONT	.9/ JAN 11 1012PM
HYD# 1084	JAN 11 450PM	1650	WVAW	DHHR	.87/ JAN 12 221AM
HYD# 1084				DUPONT	.9/ JAN 12 158AM
HYD# 451	JAN 11 507PM	1707	WVAW	DHHR	.83/ JAN 11 1107PM
HYD# 451				DUPONT	1/ JAN 11 1012PM
RIVER KAN TURNPIKE NEW HYD	JAN 11 537PM	1737	WVAW	DHHR	.85/ JAN 12 107AM
RIVER KAN TURNPIKE NEW HYD				DUPONT	.82/ JAN 12 158AM
HYD# 2809	JAN 11 550PM	1750	WVAW	DHHR	.59/JAN 12 107AM
HYD# 2809				DUPONT	.8/ JAN 12 158AM
HYD# 2018	JAN 11 550PM	1645	WVAW	DHHR	.84/ JAN 12 107AM
HYD# 2018				DUPONT	.9/ JAN 11 1012PM
HYD# 12530	JAN 11 801PM	2001	WVAW	DHHR	.78/ JAN 12 321AM
HYD# 6712	JAN 11 837PM	2037	WVAW	DHHR	.68/ JAN 12 321AM
HYD# A 5017	JAN 11 1004PM	2204	WVAW	DHHR	.60/ JAN 12 345AM
HYD # 341	JAN 12 1006AM	1006		MATRIC	0.496/ JAN 12 209PM
HYD # 1026	JAN 12 1026 AM	1026		MATRIC	0.046 / JAN 12 238PM
HYD # 926	JAN 12 1050 AM	1050		MATRIC	0.045 / JAN 12 238PM
HYD #215	JAN 12 1230PM	1230		MATRIC DHHR	0.021/ JAN 12 0.02 / JAN 12
HYD # 826	JA N 12 1245 PM	1245		MATRIC	0.0 / JAN 12

SAMPLE ANALYSIS LOG FOR WV AMERICAN WATER INCIDENT
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AS OF: JAN 13 2014, 1117

K. C. Mall	JAN 12 1244 PM	1244		MATRIC	0.051 PPM
HYD # 821	JAN 12 1313 PM	1313	WVAW	MATRIC	0.035 PPM
HYD # 844	JAN 12 1320	1320	WVAW	MATRIC	ND
HYD # 334	JAN 12 1324	1324	WVAW	MATRIC	ND
HYD # 445	JAN 12 1345	1345	WVAW	MATRIC	0.066 PPM
HYD # 168A	JAN 11	1457	WVAW	Test America	0.85 PPM
HYD # 168B	JAN 11	2314	WVAW	Test America	0.32 PPM
HYD # 1783	JAN 11	1515	WVAW	Test America	0.82 PPM
HYD # 1418	JAN 11	1600	WVAW	Test America	0.82 PPM
HYD # 2018	JAN 11	1621	WVAW	Test America	0.80 PPM
HYD # 1501	JAN 11	1645	WVAW	Test America	0.79 PPM
HYD # 2809	JAN 11	1750	WVAW	Test America	0.74 PPM
HYD # 1900	JAN 11	1521	WVAW	Test America	0.56 PPM
HYD # 986	JAN 11	1618	WVAW	Test America	0.72 PPM
Wills Creek Booster	JAN 11	1836	WVAW	Test America	0.44 PPM
City Hall Tank	JAN 11	2109	WVAW	Test America	ND
Leather Wood Tank	JAN 11	2157	WVAW	Test America	ND
Ex. 6 - Personal Privacy (HYD# 487)	JAN 11	2200	WVAW	Test America	0.51 PPM
HYD #12293	JAN 11	2330	WVAW	Test America	0.63 PPM
Ex. 6 - Personal Privacy	JAN 11	0008	WVAW	Test America	0.68 PPM
HYD#168	JAN 12	1457	WVAW	DHHR	0.50 PPM
HYD#921	JAN 12	1313	WVAW	DHHR	0.13 PPM
HYD#844	JAN 12	1320	WVAW	DHHR	0.06 PPM
HYD#445	JAN 12	1345	WVAW	DHHR	0.16 PPM
HYD#1751	JAN 12	1244	WVAW	DHHR	0.14 PPM
HYD#1031	JAN 12 930AM	0930	WVAW	MATRIC	0.563 PPM
HYD#1600	JAN 12 10AM	1000	WVAW	MATRIC	0.071 PPM
Trace Fork Dress Barn	JAN 12 1027AM	1027	WVAW	MATRIC	0.55 PPM
Trace Fork Pet Smart	JAN 12 1045AM	1045	WVAW	MATRIC	0.061 PPM
HYD#407	JAN 12 1048AM	1048	WVAW	MATRIC	0.039 PPM
HYD#1900	JAN 12 1101AM	1101	WVAW	MATRIC	0.060 PPM
Wheeler HYD#309	JAN 12 1115 AM	1115	WVAW	MATRIC	0.050 PPM
Wheeler HYD#788	JAN 12 1125AM	1125	WVAW	MATRIC	0.039 PPM
Trace Fork Target	JAN 12 525PM	1725	WVAW	MATRIC	0.20 PPM

SAMPLE ANALYSIS LOG FOR WV AMERICAN WATER INCIDENT
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HYD#409	JAN 12	2132	WVAW	DHHR	0.08 PPM
HYD#409	JAN 12	2132	WVAW	MATRIC	ND
HYD#413	JAN 12	2137	WVAW	DHHR	0.05 PPM
HYD#413	JAN 12	2137	WVAW	MATRIC	0.0369 PPM
HYD#424	JAN 12	2152	WVAW	DHHR	0.04 PPM
HYD#424	JAN 12	2152	WVAW	MATRIC	ND
HYD#2450	JAN 12 1154	1154	WVAW	DHHR	0.40 PPM
HYD#1248	JAN 12 1405	1405	WVAW	MATRIC	0.24 PPM
Ex. 6 - Personal Privacy	JAN 12 1343	1343	WVAW	MATRIC	0.24 PPM
HYD#2153	JAN 12 1225	1225	WVAW	MATRIC	0.13 PPM
HYD#1817	JAN 12 1315	1315	WVAW	MATRIC	0.23 PPM
HYD#6410	JAN 12 1330	1330	WVAW	MATRIC	0.28 PPM
Ex. 6 - Personal Privacy	JAN 12 1215	1215	WVAW	MATRIC	0.0144 PPM
HYD#2554	JAN 12 1141	1141	WVAW	MATRIC	0.14 PPM
HYD#312	JAN 12 1205	1205	WVAW	MATRIC	0.03 PPM
HYD#1705	JAN 12 1220	1220	WVAW	MATRIC	0.10 PPM
HYD#1031	JAN 12 0930	930	WVAW	Test America	0.52 PPM
HYD#293	JAN 12 1055	1055	WVAW	Test America	0.42 PPM
HYD#1600	JAN 12 1000	1000	WVAW	Test America	0.064 PPM
Trace Fork Dress Barn	JA N 12 1027	1027	WVAW	Test America	0.35 PPM
HYD#341	JAN 12 1006AM	1006	WVAW	Test America	0.31 PPM
HYD#1020	JAN 12 1026 AM	1026	WVAW	Test America	NO DETECTION
COURT ST @ CHILI'S	JAN 12 1215	1215	WVAW	Test America	NO DETECTION
HYD#293	JAN 12 1055	1055	WVAW	DHHR	0.77 PPM
HYD#307	JAN 12 1509	1509	WVAW	DHHR	
HYD#1014	JAN 12 1115	1115	WVAW	Test America	0.060 PPM
HYD#207	JAN 12 1145	1145	WVAW	Test America	0.038 PPM
HYD#309	JAN 12 1115	1115	WVAW	Test America	0.057 PPM
HYD#2549	JAN 12 1207	1207	WVAW	Test America	0.27 PPM
HYD#2382	JAN 12 1335	1335	WVAW	Test America	0.58 PPM
HYD#407	JAN 12 1048	1048	WVAW	Test America	0.034 PPM
HYD#311	JAN 12 1145	1145	WVAW	Test America	0.39 PPM
TRACE FORK BEHIND TARGET	JAN 12 1056	1056	WVAW	Test America	0.70 PPM
TRACE FORK BEHIND PET SMART	JAN 12 1045	1045	WVAW	Test America	0.088 PPM

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AS OF: JAN 13 2014, 1117

HYDRANT#2450	JAN 12 1154	1154	WVAW	Test America	0.32 PPM
HYD#926	JAN 12 1050	1050	WVAW	DHHR	0.02 PPM
HYD#4210	JAN 12 1426	1426	WVAW	MATRIC	0.025 PPM
HYD#316	JAN 12 1430	1430	WVAW	MATRIC	0.036 PPM
HYD#319	JAN 12 1500	1500	WVAW	MATRIC	0.073 PPM
HYD#3155	JAN 12 1600A	1600	WVAW	MATRIC	0.066 PPM
HYD#2140	JAN 12 1600B	1600	WVAW	MATRIC	0.040 PPM
HYD#2758	JAN 12 1350	1350	WVAW	MATRIC	0.46 PPM
HYD#2976	JAN 12 1350	1350	WVAW	MATRIC	0.45 PPM
HYD#345	JAN 12 1410	1410	WVAW	MATRIC	0.037 PPM
BREAM&2ND	JAN 12 0940	940	WVAW	MATRIC	0.031 PPM
HYD#1832	JAN 12 1003	1003	WVAW	MATRIC	0.059 PPM
Ex. 6 - Personal Privacy	JAN 12 1011	1011	WVAW	MATRIC	ERROR BEING RETESTED
HYD#2442(JONES)	JAN 12 1027	1027	WVAW	MATRIC	0.070 PPM
Ex. 6 - Personal Privacy	JAN 12 1050	1050	WVAW	MATRIC	NON DETECTABLE
WHEELER#788	JAN 12 1125	1125	WVAW	MATRIC	0.024 PPM
HYD#2554	JAN 12 1141	1141	WVAW	MATRIC	0.050 PPM
FH#207	JAN 12 1145	1145	WVAW	MATRIC	NON DETECTABLE
HYD#312	JAN 12 1205	1205	WVAW	MATRIC	NON DETECTABLE
HYD#559	JAN 12 1215	1215	WVAW	MATRIC	NON DETECTABLE
COURT ST@CHILI'S #1720	JAN 12 1215B	1215	WVAW	MATRIC	0.014 PPM
FRAME TANK	JAN 11 2001	2001	WVAW	Test America	1.2 PPM
WHITEWATER DR	JAN 11 2014	2014	WVAW	Test America	0.77 PPM
HYD#6712	JAN 11 2037	2037	WVAW	Test America	0.57 PPM
QUEEN SHOALS TANK	JAN 11 2056	2056	WVAW	Test America	2.9 PPM
14629	JAN 12 0200	200	WVAW	Test America	0.70 PPM
1832	JAN 12 0155	155	WVAW	Test America	0.46 PPM
FH 1306	JAN 12 0145	145	WVAW	Test America	0.29 PPM
HYD#488	JAN 11 1707	1707	WVAW	Test America	0.70 PPM
Ex. 6 - Personal Privacy	JAN 12 0540	540	WVAW	Test America	0.45 PPM
11726	JAN 12 0500	500	WVAW	Test America	0.29 PPM
Ex. 6 - Personal Privacy	JAN 11 1530	1530	WVAW	Test America	0.85 PPM
ARCHIBALD HILL	JAN 11 2250	2250	WVAW	Test America	0.43 PPM
Ex. 6 - Personal Privacy	JAN 11 1737	1737	WVAW	Test America	0.7 PPM

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VARIOUS COLLECTION SITES
AS OF: JAN 13 2014, 1117

HYD#1367	JAN 11 2203	2203	WVAW	Test America	0.75 PPM
HYD#2609	JAN 12 1353	1353	WVAW	MATRIC	0.065 PPM
HYD#2608	JAN 12 1436	1436	WVAW	MATRIC	0.137 PPM
HYD#2797	JAN 12 1524	1524	WVAW	MATRIC	0.225 PPM
HYD#1694	JAN 12 1648	1648	WVAW	MATRIC	0.091 PPM
HYD#1670	JAN 12 0040	40	WVAW	DHHR	0.31 PPM
HYD#109 Ex. 6 - Personal Privacy	JAN 13 0345	345	WVAW	MATRIC	0.20 PPM
HYD#48	JAN 130357	357	WVAW	MATRIC	0.019 PPM
HYD#3162	JAN 12 1630	1630	WVAW	MATRIC	0.057 PPM
HYD#2975	JAN 12 1635	1635	WVAW	MATRIC	0.40 PPM
HYD#17399	JAN 12 1714	1714	WVAW	MATRIC	0.050 PPM
Ex. 6 - Personal Privacy	JAN 12 0020	20	WVAW	DHHR	0.43 PPM
HYD#487	JAN 13 0357	357	WVAW	DHHR	0.0 PPM
HYD#271	JAN 13 0924	924	WVAW	DHHR	0.02 PPM
HYDRANT AT MOUTH OF DAVIS TRACE	JAN 12 2043	2043	WVAW	MATRIC	NOT DETECTED
EDENS FORK BAPTIST	JAN 12 2055	2055	WVAW	MATRIC	NOT DETECTED
YAWKEY QUICKMART TAP	JAN 12 2107	2107	WVAW	MATRIC	NOT DETECTED
HYD#4474	JAN 12 2118	2118	WVAW	MATRIC	NOT DETECTED
HYDRANT AT MOUTH OF TRACE FORK RT 3	JAN 12 2136	2136	WVAW	MATRIC	NOT DETECTED
HYD#1056 AT TRACE FORK	JAN 13 0833	833	WVAW	DHHR	0.44 PPM
HYD#2442(JONES)	JAN 13 0824	824	WVAW	DHHR	0.10 PPM
HYD#2418	JAN 13 1011	1011	WVAW	DHHR	0.15 PPM
SOUTH PARK HYD#341	JAN 13 0947	947	WVAW	DHHR	0.32 PPM
Ex. 6 - Personal Privacy	JAN 13 1011	1011	WVAW	DHHR	0.15 PPM
COURT STREET HYD AT CHILI'S	JAN 13 1215	1215	WVAW	DHHR	0.0 PPM
HYD#2809	JAN 13 0740	740	WVAW	MATRIC	0.0 PPM
HYD#1670	JAN 13 0750	750	WVAW	MATRIC	0.069 PPM
HYD#1832	JAN 13		WVAW	DHHR	0.02 PPM
HYD#2809	JAN 13		WVAW	DHHR	0.39 PPM
SOUTH OAKRIDGE TANK	JAN 12	2205	WVAW	MATRIC	0.486 PPM
UPPER EDGEWOOD	JAN 13	32	WVAW	MATRIC	0.259 PPM
MASSY TANK	JAN 13	55	WVAW	MATRIC	0.176 PPM
BERRY HILL TANK	JAN 13	150	WVAW	MATRIC	0.022 PPM
QUARRIER TANK	JAN 13	305	WVAW	MATRIC	0.298 PPM

SAMPLE ANALYSIS LOG FOR WV AMERICAN WATER INCIDENT
VARIOUS COLLECTION SITES
AS OF: JAN 13 2014, 1117

HYD#1815	JAN 13		WVAW	Test America	0.43 PPM
HYD#1819	JAN 13		WVAW	Test America	0.45 PPM
HYD#1746	JAN 13		WVAW	Test America	0.34 PPM
HYD# 1230	JAN 13		WVAW	Test America	0.18 PPM
HYD#2479	JAN 13		WVAW	Test America	0.41 PPM
HYD#3162	JAN 13		WVAW	Test America	0.051 PPM
HYD#3165	JAN 13		WVAW	Test America	0.062 PPM
HYD#2758	JAN 13		WVAW	Test America	0.60 PPM
HYD#1836	JAN 13		WVAW	Test America	0.63 PPM
HYD#4820	JAN 13		WVAW	Test America	0.048 PPM
HYD#4291A	JAN 13		WVAW	Test America	NOT DETECTED
HYD#4291B	JAN 13		WVAW	Test America	NOT DETECTED
HYD#3156	JAN 13		WVAW	Test America	NOT DETECTED
HYD#6470	JAN 13		WVAW	Test America	0.70 PPM
HYD#2996	JAN 13		WVAW	Test America	0.79 PPM
HYD#2976	JAN 13		WVAW	Test America	0.75 PPM
HYD#1777	JAN 13		WVAW	Test America	NOT DETECTED
HYD#4210	JAN 13		WVAW	Test America	NOT DETECTED
HYD#1900	JAN 13		WVAW	Test America	0.53 PPM
HYD#1901	JAN 13		WVAW	Test America	0.24 PPM
HYD#1867	JAN 13		WVAW	Test America	0.20 PPM
HYD#2153	JAN 13		WVAW	Test America	0.27 PPM

Ex. 5 - Attorney-Client

Ex. 5 - Attorney-Client

Ex. 5 - Attorney-Client

Ex. 5 - Attorney-Client

35TH CST (WVaID) SAMPLE LOG FOR WV AMERICAN WATER INCIDENT As of: 1/11/2014 19:00

SAMPLE LOCATION / COUNTY	DTG	SAMPLE NUMBER	SAMPLE TEAM	RAW INTAKE RESULTS	FINISHED WATER RESULTS
WVAW/ Kanawha	101230RJAN14	12:30	WVAMW	1.04 PPM	1.021 PPM
				1.35 PPM	1.56 PPM
WVAW / Kanawha	101355RJAN14	13:55	WVAMW	1.429 PPM	0.99 PPM
				1.19 PPM	1.4 PPM
WVAW / Kanawha	101600RJAN14	16:00	WVAMW	1.22 PPM	.856 PPM
				1.39 PPM	1.23 PPM
WVAW / Kanawha	101755RJAN14	17:55	WVAMW	0.802 PPM	0.777 PPM
				1.27 PPM	1.28 PPM
WVAW/ Kanawha	101950RJAN14	19:50	WVAMW	0.785 PPM	0.809 PPM
				1.2 PPM	1.4 PPM
WVAW / Kanawha	112300RJAN14	23:00	WVAMW	1.70 PPM	0.75 PPM
WVAW / Kanawha	110100RJAN14	1:00	WVAMW	1.04 PPM	0.926 PPM
WVAW / Kanawha	110300RJAN14	3:00	WVAMW	1.081 PPM	0.860 PPM
WVAW / Kanawha	110500RJAN14	5:00	WVAMW	1.187 PPM	1.01 PPM
WVAW / Kanawha	110700RJAN14	7:00	WVAMW	1.30 PPM	1.10 PPM
WVAW/ Kanawha	110900RJAN14	9:00	WVAMW	0.90 PPM	0.60 PPM
WVAW / Kanawha	111000RJAN14	10:00	WVAMW	0.482 PPM	0.62 PPM
WVAW/ Kanawha	111415RJAN14	14:15	WVAMW	0.8 PPM	0.30 PPM

3302016

STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES
BUREAU FOR PUBLIC HEALTH
OFFICE OF ENVIRONMENTAL HEALTH SERVICES

Joe Manchin III
Governor

Martha Yeager Walker
Secretary

August 25, 2006

WVAWC-KANAWHA VALLEY DIST
HOLBROOK, THOMAS W
P O BOX 1906
CHARLESTON, WV 25327

RE: WVAWC-KANAWHA VALLEY DIST
PWSID WV3302016, Kanawha County

Dear Mr. Holbrook:

Your local Source Water Assessment and Protection (SWAP) emergency/contingency and local management activities has been received and reviewed. In the future, as your water system SWAP program progresses; a more formal management plan may be developed.

If you have any questions, please contact me at 304-558-6713.

Sincerely,

J. Scott Rodehaver

J. Scott Rodehaver, Assistant Manager
Source Water Assessment and Protection Program
Environmental Engineering Division

JSR/cjj

Capitol and Washington Streets
1 Davis Square, Suite 200
Charleston, West Virginia 25301-1798
Telephone: 304-558-2981

SURFACE SYSTEMS - EMERGENCY/CONTINGENCY AND LAND MANAGEMENT PLAN

(Please Keep a Copy for Your Files)

PLEASE CHECK APPROPRIATE ITEM(S). PRINT OR TYPE AND ATTACH ADDITIONAL SHEETS IF NEEDED.

System Name: West Virginia American Water-Kanawha Valley District County: Kanawha
Address: 1600 Pennsylvania Avenue PWSID#: WV3302016
Charleston, WV 25302 Date: 8-10-2006
Telephone: 304-340-2036 Fax: 304-345-4963 Email: rboggess@wvawater.com

1. The water users will be notified of a water emergency by:
   Word-of-mouth ___ Posted notices ___ Door-to-door canvas ___ Radio ✓ Newspaper ✓
   Other _____

2. Phone numbers for emergency services:
   Police: 911 Fire: 911 Ambulance: 911
   County Director of Emergency Services (Name and number) _____
   Dale Petry 304-746-7911

3. Name, location, and phone number of person(s) that the consumer should notify regarding a potential problem so that the operator can assess the potential problem and notify the appropriate parties:
   American Water call center 1-800-685-8660

4. This plan will be reviewed every five (5) years. The revised plan will be dated and distributed to the following: Plant staff and selected management staff

5. The most likely causes of a water disruption are: Drought ___ Contaminant spill ___ Flooding ✓
   Other Main breaks

6. Short-term alternative sources of water are:
   ___ Locally purchased bottled water ___ Backup well
   ✓ Transported by (name and phone) West Virginia American Water personnel
   ___ Other _____

7. Long-term alternative sources of water are: None
   ___ Another intake or well (Is this intake or well available for use?) Yes___ No___
   ___ Connection to another system (name)_____
   ___ Other _____

8. Intake shut down is the responsibility of Local utility management

9. A list of possible contractors needed during an emergency is maintained? Yes ✓ No___ This list is maintained and updated by Risk Management Department

10. Please identify any local source water protection management activities on the list below that you are Planning to do with a (P), Currently doing with a (C), or have Interest in doing with an (I) in your area.
    C Risk Management Plans
    C Emergency Response Plans
    ___ Contingency Plans
    ___ Participate in an early warning communication network
    C Stream monitoring beyond the normal regulatory requirements

_____ Land use measures (i.e. prohibition of various land uses in area, special permitting of land uses, transfer of development rights, growth controls, etc.)
_____ Land or easement acquisitions
P Public education and outreach activities (i.e. signage and stencils for visual awareness of protection areas, and newspaper, radio or TV ads about drinking water) ORSANCO
C Participate in a local source water or watershed committee Little Sandy Creek Watershed
P Review your watershed for potential contaminant sources
_____ Surface water flow modeling

11. Public participation and education will be accomplished by: Word-of-mouth ___
___ Posted notices ___ Public meetings ___ Pamphlets ___ Lectures
√ Other CCRs

12. List any additional ideas or explanations of possible source water activities for your area in the space provided below.

This survey was completed on 8-10-2006 by Thomas W Holbrook
Date Signature

Thomas W. Holbrook
Printed Name

Water Quality Manager
Position Title

2008003599 F
Operator Certification Number

THANK YOU!!!

The Source Water Assessment and Wellhead Protection Program is administered by the WV Department of Health and Human Resources, Bureau for Public Health. The **EMERGENCY/CONTINGENCY AND LAND MANAGEMENT PLAN** information provided will be used to update and maintain the currently approved wellhead/source water protection plans and related projects. If you have any questions or comments regarding this survey, please contact Scott Rodeheaver at:

Office of Environmental Health Services
Capitol and Washington Streets
1 Davis Square, Suite 200
Charleston, WV 25301-1798
Phone: 304.558.6713 Fax: 304.558.0324
Email: scottrodeheaver@wvdhhr.org
Website at http://www.wvdhhr.org/oehs/eed/swap/

JOHN D. ROCKEFELLER IV
WEST VIRGINIA

United States Senate

WASHINGTON, DC 20510-4802

January 13, 2014

Gina McCarthy
Administrator
Environmental Protection Agency
1200 Pennsylvania Avenue NW
Washington, D.C. 20460

Dr. Tom Frieden
Director
Centers for Disease Control
1600 Clifton Road
Atlanta, GA 30333

Director Frieden & Administrator McCarthy,

I have dedicated my fifty year career in public service to the health of the people and the businesses in my state. A diverse and growing state economy, good jobs and healthy families are at the heart of a thriving state. Our state is a special place where neighbors help neighbors and our work ethic and resilience are second to none, even as crisis this week has tested our mettle. And when crisis arises, those of us in the federal government should always stand ready to help our families and businesses.

The recent chemical leak at the Freedom Industries plant near Charleston, West Virginia has left over 300,000 West Virginians without access to safe, clean water. Despite progress in responding to the spill, the people of West Virginia are still struggling to open schools, get businesses back up and running, and frankly take care of household needs like laundry, dishes, and cleaning.

Last Thursday 7,500 gallons of crude 4-methylcyclohexane methanol (MCHM) leaked from a failed storage tank at Freedom Industries, located only one and a half miles upstream from West Virginia American Water's intake on the Elk River. The chemical, which is toxic for human consumption, was detected at high levels in tap water. The President has declared a state of emergency for the nine impacted West Virginia counties and an emergency "do not use" order has been in effect for five days since the spill. Multiple federal, state, and local agencies are on the ground serving the citizens of West Virginia: distributing emergency supplies, testing and purifying the water table, and investigating what caused the spill to occur.

The long term health effects resulting from exposure are unclear. I have heard from many of my constituents that they are concerned and have questions regarding public health for themselves, their children, their pets and livestock. They are worried about both the immediate impact, but also the long-term effects of this chemical in our water supply, in the water treatment facility supplied by the Elk River, and in the Kanawha and Ohio Rivers that feed other water treatment facilities. Because remediation and containment of the leak site are incomplete, I have also heard from residents who fear ongoing leaching from contaminated soil, river banks and the holding tanks which could result in further contamination the water supply at a time when the water treatment facility may have compromised filters and taxed processing systems.

At the time of the spill, neither science nor industry had existing protocols for either testing or safe levels of exposure to this chemical. A great deal of work has been done in recent days to determine protocols to protect public safety and ensure confidence.

I understand that both the Center for Disease Control and Prevention (CDC) and the Environmental Protection Agency (EPA) have worked with our state and local efforts to respond to this spill. I would ask that your agencies continue to do everything possible to help our West Virginia families and businesses get back on their feet and ensure that their needs are being met after this very difficult event.

I request that the CDC and EPA work together to study long-term public health risks associated with a MCHM spill of this magnitude. Such a study will not only help the people of West Virginia but also inform any future incidents involving this compound. I am making this request of two separate agencies with the goal that no stone will go unturned, and no jurisdictional confusion will leave any key question unanswered. Please respond to me with an explanation of how this study will be done, including which agency will undergo which portion of the inquiry and how the two agencies will coordinate their efforts.

In the coming weeks and months, the assistance of both the Environmental Protection Agency and the Center for Disease Control and Prevention will be critical in long-term well being of the state of West Virginia and its citizens.

It is at times like these that I am particularly grateful for the expertise available through you agencies. Thank you in advance for your careful and prompt attention to this health concern.

Sincerely,

John D. Rockefeller IV

CC: Agency for Toxic Substances and Disease Registry
4770 Buford Hwy NE
Atlanta, GA 3034

Operational Sampling Results as of 9:30AM 23 January 2014						
Notes: 1. All Lab results are recorded in parts per million (ppm).						
2. CDC Health Threshold is 1 part per million (1,000 parts per billion).						
3. Samples reported in this Tracking Log are tested to a level of 10 parts per billion (ppb). Lab results are reflected in parts per						
4. Any Lab result below 10 parts per billion (ppb) is reflected as Non Detected (ND).						
Sample Reference Number (C###)	Sample Location	Date Collected (Month/Date = 1/17)	Time Collected (24 HR EX 12:34)	Lab #1 Results (ppb)	Lab #2 Results (ppb)	Resample Reference Number (C###)
C001	BOONE COUNTY HOSPITAL	1/17	12:25	49	56	C058
C002	HYD 1020, 32ND ST & VIRGINIA AVE, MEMORIAL HOSPITAL	1/17	13:42	ND	ND	
C003	MEMORIAL HOSPITAL, 3200 MACORKLE AVE, DIALYSIS	1/17	13:15	216	85	C055
C004	HYD 92, CAMC GENERAL HOSPITAL, WASHINGTON ST.	1/17	12:39		ND	
C005	ST. FRANCIS HOSPITAL, 333 LAIDLEY ST	1/17	10:27		ND	
C006	MEMORIAL HOSPITAL, 3200 MACORKLE AVE.	1/17	13:16	ND	ND	
C007	HYD 49, WASHINGTON ST & LAIDLEY	1/17	11:22		ND	
C008	CHARLESTON GENERAL HOSPITAL, 501 MORRIS	1/17	12:22		ND	
C009	CHARLESTON GENERAL HOSPITAL, 501 MORRIS, DIALYSIS	1/17	12:16		ND	
C010	WOMAN AND CHILDRENS, 800 PENNSYLVANIA AVE	1/17	11:47	ND	ND	
C011	HYD 215, WOMAN AND CHILDRENS	1/17	11:33	ND	ND	
C012	ST FRANCIS, 333 LAIDLEY, DALYSIS	1/17	10:23	ND	ND	
C013	THOMAS MEMORIAL HOSPITAL BASEMENT	1/17	13:46	ND	ND	
C014	THOMAS MEMORIAL, 436 DIVISION ST	1/17	14:02	ND	ND	
C015	BRADFORD & KANAWHA BLVD E.	1/17	12:22	ND	ND	
C016	CLINIC, 1306 KANAWHA BLVD	1/17	12:04	ND	ND	
C017	HIGHLAND HOSPITAL, RM B59	1/17	12:56		ND	
C018	56TH ST & NOYES AVE	1/17	13:12	ND	ND	

C019	HYD 168, WERTZ AVE	1/17	15:10	ND	ND	
C020	HYD 1670, MIDLAND AVE & BLUEFIELD AVE	1/17	14:50	ND	ND	
C021	HYD 1720, CLEDINEN & LEE	1/17	15:25	ND	ND	
C022	HYD 2809, COMMERCE/MALDEN	1/17	14:25	ND	ND	
C023	HYD 2023, MALDEN (TITAN DR)	1/17	14:40	ND	ND	
C024	HYD 2018, PEIDMONT & SNOWHILL	1/17	14:13	ND	ND	
C025	HYD 2071, Ex. 6 - Personal Privacy	1/17	15:55	ND	ND	
C026	HYD 1783, CONNER DRIVE	1/17	15:40	ND	ND	
C027		1/17	16:00	ND	ND	
C028		1/17	15:50	ND	ND	
C029		1/17	15:17	ND	ND	
C030		1/17	16:12	ND	ND	
C031		1/17	16:28	ND	ND	
C032		1/17	15:08	ND	29	C062
C033	1418 WASHINGTON / 50TH ST	1/17	15:00	25	28	C063
C034	1020 32ND / VA CHARLESTON MEMORIAL	1/17	15:36	ND	ND	
C035	HYD 271, 2ND AVE & BREAM	1/17	16:30	ND	ND	
C036	HYD 978, 27TH & 5TH AVE	1/17	14:30	ND	ND	
C037	HYD 1501, RT 21, SHADY SIDE RD	1/17	16:00	ND	ND	
C038	HYD 1167, WILSON AVE	1/17	14:40	ND	ND	
C039	HYD 1306, LILLY DR & SUGAR ST	1/17	15:40	ND	ND	
C040	HYD 1096, 28TH ST & DUNBAR	1/17	15:15	ND	ND	
C041	HYD 487, 1ST AVE & DUNBAR AVE	1/17	14:55	ND	ND	
C042	HYD 844, PATRICK ST & BLVD	1/17	14:27	ND	ND	
C043	RAW	1/17	17:16	ND	ND	
C044	FINISHED	1/17	17:16	ND	ND	
C045	HYD 2554, MOUNTIANEER BLVD	1/17	17:25	ND	ND	
C046	HYD 1600, JEFFERSON RD., S CHARLESTON	1/17	17:18	ND	ND	
C047	HYD 6683, KANAWHA RVR IN FRONT OF DAR	1/17	17:00	ND	ND	
C048	HYD 409, MONTROSE AND 2ND AVE	1/17	15:28	ND	ND	
C049	HYD 1900, DANNER RD	1/17	15:07	243	222	C060
C050	HYD 986, 1ST AVE AND D ST.	1/17	15:19	ND	ND	
C051	HYD 1084, CHILTON AND KANAWHA TPK	1/17	16:46	ND	ND	
C052	HYD 413, 5TH AND 6TH ST	1/17	16:00	ND	ND	

Ex. 6 - Personal Privacy

C053	HYD 424, 17TH AND C ST	1/17	16:08	ND	ND	
C054	HYD 451, INDIANA AND ROCK LAKE	1/17	16:35	ND	ND	
C055	MEMORIAL HOSPITAL, 3200 MACORKLE AVE, DIALYSIS	1/18	0:01	40	62	C061
C056	RAW	1/18	6:00	ND	ND	
C057	FINISHED	1/18	6:00	ND	ND	
C058	BOONE COUNTY HOSPITAL	1/18	8:50	46	44	C096
C059	BOONE MEMORIAL FIRE HYDRANT	1/18	10:50	68	60	
C060	HYD Ex. 6 - Personal Privacy	1/18	15:54	319	190	C073
C061	CAMC MEMORIAL HOSPITAL, DIALYSIS	1/18	13:32	ND	12	C093
C062	HYD 826, 56TH NOYES AVE	1/18	13:00	ND	ND	
C063	HYD Ex. 6 - Personal Privacy	1/18	12:45	ND	ND	
C064	RAW	1/18	18:05	ND	ND	
C065	FINISHED	1/18	18:05	ND	ND	
C066	HYD 1751 KANAWHA MALL / 57TH ST	1/18	16:52	ND	ND	
C067	HYD 341 SOUTH PARK & MACORKLE AVE	1/18	17:40	ND	ND	
C068	HYD 926 UC / 22ND CHEROKEE	1/18	16:52	ND	ND	
C069	HYD 334 FRONTIER BLDG	1/18	17:18	ND	ND	
C070	HYD 921 Ex. 6 - Personal Privacy	1/18	16:31	0	ND	
C071	HYD 3614 BLUE CREEK Ex. 6 - Personal Privacy	1/18	23:15		22	
C072	HYD 1732 132 STOFFEL AND BUS GARAGE	1/19	0:05		ND	C149
C073	HYD 1900 DANNER HOLLOW	1/19	9:15	ND	ND	
C074	HYD 2076 YOUNGS BOTTOM MEAR TANK	1/18	21:45	ND	ND	C151
C075	HYD 2 MARTINS BRANCH CORPS STATION	1/18	23:35	19	20	C157
C076	HYD 1 ROCKY FORK AND FISHERS BRANCH	1/18	23:20	ND	ND	C137
C077	HYD 6562 Ex. 6 - Personal Privacy	1/18	22:55	13	22	C0983
C078	HYD 2321 HONAKER AT RT 21	1/18	22:34	ND		C170
C079	HYD 1944 DEMPSEY AND W. WASHINGTON	1/18	21:30	ND	ND	
C080	HYD 2582 REBECCA RD	1/18	22:00	ND	ND	
C081	HYD 1765 WIND SONG WAY AND CROSS LANES DR	1/18	21:46	ND	ND	C138
C082	HYD 1419 WESTMORELAND LANE	1/18	21:06	97	56	
C083	HYD 2331 MARTINS BRIDGE AND RT 21	1/18	22:42		ND	C097
C084	HYD 2305 WHITE OAK DR AND RIDGEVIEW DR	1/18	23:28	ND	ND	C166

C085	HYD 2354 Ex. 6 - Personal Privacy	1/18	23:18		ND	C169
C086	HYD 14544 TUPPERS CIRCLE AND NEW GEAR	1/18	23:51	11	16	
C087	HYD 1031 BURLEW AND MARKET DRIVE	1/18	21:20	ND	ND	
C088	HYD 311 EDGEWOOD AND WOODS DRIVE	1/18	21:20		ND	
C089	HYD 2395 CLEVER PATCH ACRES AND KENDRA LANE	1/18	23:00		57	C165
C090	COAL FORK FIRST HYD	1/18	22:44		ND	
C091	HYD 1051 SUMMIT DRIVE-TOP OF HILL	1/18	21:28		13	
C092	HYD 1900 DANNER HOLLOW/ TERRY MASSEY	1/19	9:30	ND	ND	
C093	CHARLESTON MEMORIAL HOSPITAL DIALYSIS ROOM	1/19	9:30	ND	ND	
C094	OLD HOUSE FH 5731	1/19	11:00	11	10	C148
C095	REYNOLDS AVE/US RTE 119 FH 1831	1/19	9:50	ND	ND	
C096	BOONE MEMORIAL HOSPITAL, MEN'S ROOM, 1ST FLOOR	1/19	12:04	31	30	
C097	HYD 2331 MARTINS BRIDGE AND RT 21	1/19	22:42	ND		C168
C098	Ex. 6 - Personal Privacy	1/19	16:05	ND	ND	
C099	HYD 2401 Ex. 6 - Personal Privacy	1/19	15:30	46	43	
C100	RAW	1/19	18:15	ND	ND	
C101	FINISHED	1/19	18:15	ND	ND	
C102	RAW	1/19	6:00	ND	ND	
C103	FINISHED	1/19	6:00	ND	ND	
C104	RAW	1/19	18:35	ND	ND	
C105	FINISHED	1/19	18:35	ND	ND	
C106	Sample Reference Number Not Used					
C107	BONA VISTA BOOSTER	1/19	20:45	23		
C108	MARIEL HEMMINGWAY	1/19	21:11	32		
C109	HYD 1901 WALKER CAT AT BELLE	1/19	22:07	ND		
C110	HYD 908 CURRY HOLLOW-MARMET	1/20	20:50	ND		
C111	Sample Reference Number Not Used					
C112	Sample Reference Number Not Used					
C113	Sample Reference Number Not Used					
C114	SOUTH PARK AND GRUBB	1/19	23:05	10		
C115	HYD 1530 MT ALPHA	1/19	22:20	172		

C116	HYD 888 MASSEY CIRCLE	1/19	21:20	22		
C117	Sample Reference Number Not Used					
C118	Sample Reference Number Not Used					
C119	Sample Reference Number Not Used					
C120	Sample Reference Number Not Used					
C121	HYD 1600, JEFFERSON RD.	1/20	0:50	44		C158
C122	TRACE FORK BEHIND TARGET	1/19	23:50	21		C161
C123	HYD 2549 ARMY RESERVES BEHIND WALMART	1/20	0:15	ND		C159
C124	Sample Reference Number Not Used					
C125	Sample Reference Number Not Used					
C126	Sample Reference Number Not Used					
C127	HYD 2719 8723 COAL RIVER RD AND VORPE RD	1/20	1:18	ND		
C128	Sample Reference Number Not Used					
C129	Sample Reference Number Not Used					
C130	Sample Reference Number Not Used					
C131	Sample Reference Number Not Used					
C132	Sample Reference Number Not Used					
C133	Sample Reference Number Not Used					
C134	Sample Reference Number Not Used					
C135	Sample Reference Number Not Used					
C136	Sample Reference Number Not Used					
C137	HYD 1 ROCKY FORK AND FISHERS BRANCH	1/20	2:22	ND		
C138	HYD 1765 WIND SONG WAY AND CROSS LANES DR	1/20	2:00	ND		
C139	CHARLESTON RAW	1/20	6:00	ND	ND	
C140	CHARLESTON FINISHED	1/20	6:00	ND	ND	
C141	HYD 2598 POINT LICK	1/20	3:00	ND	ND	
C142	CAMPBELL CREEK/ASHTON MTN	1/20	0:12	24	36	
C143	HYD 578 SUMMIT VIEWMONT	1/20	6:15		ND	
C144	HYD 562 STONEWALL AND WILTON	1/20	5:43		ND	
C145	HYD 312 SOMERSET AND GRACE	1/20	5:12		ND	
C146	HYD 2932, 17 COAL FORK	1/20	4:20		ND	
C147	HYD 2525 CAMPBELLS CREEK ANGEL MEADOW	1/20	1:00		33	

C148	HYD 5731 OLD HOUSE RD AND AARONS FORK RD	1/20	10:15	ND	ND	
C149	HYD 1732 132 STOFFEL AND BUS GARAGE	1/20	11:01	ND	ND	
C150	HYD 1831 REYNOLDS AVE/US RTE 119	1/20	11:30	ND	ND	
C151	HYD 2076 YOUNGS BOTTOM MEAR TANK	1/20	12:55	ND	ND	
C152	HYD 2614 BLUE CREEK AND Ex. 6 - Personal Privacy	1/20	12:30	ND	ND	
C153	RAW	1/20	13:45		ND	
C154	FINISHED	1/20	13:45		ND	
C155	Sample Reference Number Not Used					
C156	Sample Reference Number Not Used					
C157	HYD 2 MARTINS BRANCH CORPS STATION	1/20	14:20	ND	13	
C158	HYD 1600 JEFFERSON RD	1/20	18:25	28		
C159	HYD 2549 ARMY RESERVES BEHIND WALMART	1/20	18:15	ND		
C160	HYD 6903 RT 214 AND WILLOW DR	1/20	17:40	ND		
C161	HYD 6788 TRACE FORK BEHIND TARGET	1/20	16:45	ND		
C162	HYD 1694 CHESTNUT ST AND FAIRVIEW	1/20	14:30	ND		
C163	HYD 1662 Ex. 6 - Personal Privacy	1/20	15:00	71		C258
C164	TOP SUMMIT DR	1/20	19:20	ND	ND	
C165	HYD 2395 CLEVER PATCH ACRES AND KENDRA LANE	1/20	18:25	ND	ND	
C166	HYD 2305 WHITE OAK DR AND RIDGEVIEW DR	1/20	16:50	ND	ND	
C167	HYD 2315 TUPPER CREEK AND NEWQUAR	1/20	14:30	ND	ND	
C168	HYD 2331 MARTINS BRIDGE AND RT 21	1/20	11:45	ND	ND	
C169	HYD 2354 Ex. 6 - Personal Privacy	1/20	15:30	ND	ND	
C170	HYD 2321 HONAKER AT RT 21	1/20	13:05	ND	ND	
C171	HYD 312 SOMERSET AND GRACE	1/20			ND	
C172	COAL FORK FIRST HYD	1/20	9:02		ND	
C173	BONA VISTA BOOSTER	1/20	9:35		23	
C174	FH 2719 8723 COAL RIVER RD & VORPE RD	1/20	11:12		25	
C175	HYD 2797 HEAVENLY DRIVE AND MIDKIFF DR	1/20	21:17	22	27	
C176	HYD 2651 CHILDERS RD & GREENVIEW RD	1/20	9:55		ND	
C177	HYD 2855 FALLS CREEK RD	1/20	22:46	66	61	
C178	HYD 2609 TRACE FORK & CORRIDOR G	1/20	9:41		13	

C179	HYD 2656 GREENVIEW RD. NEAR TANK NEAR TANK LEG	1/20	10:22		ND	
C180	HYD 2031 STRAWBERRY RD & COAL RIVER RD	1/20	11:43		ND	
C181	HYD 2932 Ex. 6 - Personal Privacy	1/21	2:20		ND	
C182	HYD 2598 POINT LICK	1/21	1:15		ND	
C183	HYD 2525 CAMPBELLS CREEK ANGEL MEADOW	1/20	11:50		ND	
C184	HYD 2518 BLOUNT TANK CAMBELL CREEK &ABSTON MOUNTAIN	1/20	11:30		ND	
C185	CEMETARY TANK	1/21	3:02		40	
C186	HYD 2979 Ex. 6 - Personal Privacy	1/21	2:31		40	
C187	QUARRY HYD 29	1/21	3:40	ND	ND	
C188	HYD 853 CHAPPEL RD	1/21	3:10		ND	
C189	HYD 1610 MT ALPHA	1/21	2:45	23	22	
C190	SOUTH PARK AND GRUBB	1/21	1:35		10	
C191	HYD 3018 SOUTHPARK	1/21	0:45	181	98	
C192	HYD 888 MASSEY CIRCLE	1/21	10:10		22	
C193	HYD 1403 TENNIS CLUB	1/21	23:30	183	146	
C194	Sample Reference Number Not Used					
C195	Sample Reference Number Not Used					
C196	HYD 5708 KELLY'S CREEK- 4TH PAST BST	1/21	11:50		ND	C199
C197	POND GAP TANK	1/21	12:20		96	C247
C198	POND GAP BOOSTER	1/21	12:05		62	C245
C199	HYD 5176 KELLY'S CREEK- 4TH BEFORE TANK	1/21	13:25		64	
C200	Sample Reference Number Not Used					
C201	Sample Reference Number Not Used					
C202	Sample Reference Number Not Used					
C203	Sample Reference Number Not Used					
C204	Sample Reference Number Not Used					
C205	Sample Reference Number Not Used					
C206	Sample Reference Number Not Used					
C207	Sample Reference Number Not Used					
C208	Sample Reference Number Not Used					
C209	Sample Reference Number Not Used					
C210	Sample Reference Number Not Used					

C211	Sample Reference Number Not Used					
C212	Sample Reference Number Not Used					
C213	Sample Reference Number Not Used					
C214	Sample Reference Number Not Used					
C215	Sample Reference Number Not Used					
C216	Sample Reference Number Not Used					
C217	Sample Reference Number Not Used					
C218	Sample Reference Number Not Used					
C219	Sample Reference Number Not Used					
C220	Sample Reference Number Not Used					
C221	Sample Reference Number Not Used					
C222	RAW	1/22	7:40	ND	ND	
C223	FINISHED	1/22	7:40	ND	ND	
C224	RAW	1/21	18:00	ND		
C225	FINISHED	1/21	18:00	ND		
C226	RAW	1/22	12:00	ND		
C227	FINISHED	1/22	12:00	ND		
C228	Sample Reference Number Not Used					
C229	TARGET	1/22	12:15	26		
C230	Sample Reference Number Not Used					
C231	EMMON	1/22	11:10	ND		
C232	Sample Reference Number Not Used					
C233	HYD 2797 HEAVENLY DRIVE AND MIDKIFF DR	1/22	16:30	38		
C234	Sample Reference Number Not Used					
C235	Sample Reference Number Not Used					
C236	HYD 2719 8723 COAL RIVER RD AND VORPE RD	1/22	13:30	34		
C237	Sample Reference Number Not Used					
C238	Sample Reference Number Not Used					
C239	Sample Reference Number Not Used					
C240	Sample Reference Number Not Used					
C241	CEMETARY TANK	1/22	16:18	14		
C242	Sample Reference Number Not Used					
C243	RAW	1/22	18:00	ND		
C244	Sample Reference Number Not Used					

C245	POND GAP BOOSTER	1/22	16:45	35		
C246	Sample Reference Number Not Used					
C247	POND GAP TANK	1/22	17:00	117		
C248	HYD 888 MASSEY CIRCLE					
C249	HYD 2979 Ex. 6 - Personal Privacy	1/22	18:00	ND		
C250	Sample Reference Number Not Used					
C251	HYD 1289 SPARK AND GRUBB RD	1/22	15:05	ND		
C252	Sample Reference Number Not Used					
C253	Sample Reference Number Not Used					
C254	Sample Reference Number Not Used					
C255	Sample Reference Number Not Used					
C256	Sample Reference Number Not Used					
C257	Sample Reference Number Not Used					
C258	HYD 1622, Ex. 6 - Personal Privacy	1/22	18:45	33		
C259	Sample Reference Number Not Used					
C260	Sample Reference Number Not Used					
C261	Sample Reference Number Not Used					
C262	Sample Reference Number Not Used					
C263	Sample Reference Number Not Used					
C264	Sample Reference Number Not Used					
C265	Sample Reference Number Not Used					
C266	Sample Reference Number Not Used					
C267	Sample Reference Number Not Used					
C268	Sample Reference Number Not Used					
C269	Sample Reference Number Not Used					
C270	Sample Reference Number Not Used					

Ex. 5 - Deliberative

HOW TO FLUSH YOUR PLUMBING SYSTEM

WEST VIRGINIA AMERICAN WATER

Ex. 5 - Deliberative

1-800-685-8660 or visit our website at www.westvirginiaamwater.com

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Ex. 5 - Deliberative

binetti, victoria

From: Arguto, William
Sent: Friday, January 17, 2014 1:07 PM
To: binetti, victoria
Subject: Draft news

News as of this afternoon:

Ex. 5 - Deliberative

at an estimated ___ on ~~[redacted]~~ 1/15

Ex. 5 - Deliberative

Ex. 5 - Deliberative

Gray, Wendy

Subject: MCHM PPH Byproducts
Location: Meetme Line Ex. 6 - Personal Privacy

Start: Thu 1/30/2014 10:30 AM
End: Thu 1/30/2014 11:00 AM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Gray, Wendy
Required Attendees: Hedrick, Elizabeth; Magnuson, Matthew; Allgeier, Steve; Weber, Eric
Optional Attendees: Arguto, William

Updated with Access Code

Ex. 5 - Deliberative

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